

MAR 1983  
RECEIVED  
NASA STI FACILITY  
ACCESS DEPT.

[illegible]



## ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges.

STAR (N-10000 Series)	N82-28243 - N82-30281
-----------------------	-----------------------

IAA (A-10000 Series)	A82-38103 - A82-41587
----------------------	-----------------------

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by PRC Government Information Systems.

# **AEROSPACE MEDICINE AND BIOLOGY**

**A CONTINUING BIBLIOGRAPHY  
WITH INDEXES**

**(Supplement 238)**

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in October 1982 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA)*



Scientific and Technical Information Branch

**National Aeronautics and Space Administration**

Washington, DC

**1982**

NASA SP-7011 and its supplements are available from the National Technical Information Service (NTIS). Questions on the availability of the predecessor publications, Aerospace Medicine and Biology (Volumes I - XI) should be directed to NTIS.



# INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* lists 583 reports, articles and other documents announced during October 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*. The first issue of the bibliography was published in July 1964.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the Earth's atmosphere or in interplanetary space. References describing similar effects of biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis is placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion.

Each entry in the bibliography consists of a bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections: *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Two indexes -- subject and personal author -- are included.

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1982 Supplements.

# AVAILABILITY OF CITED PUBLICATIONS

## IAA ENTRIES (A82-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows. Paper copies of accessions are available at \$8.00 per document. Microfiche<sup>(1)</sup> of documents announced in IAA are available at the rate of \$4.00 per microfiche on demand, and at the rate of \$1.35 per microfiche for standing orders for all IAA microfiche.

Minimum air-mail postage to foreign countries is \$2.50 and all foreign orders are shipped on payment of pro-forma invoices.

All inquiries and requests should be addressed to AIAA Technical Information Service. Please refer to the accession number when requesting publications.

## STAR ENTRIES (N82-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code preceded by the letters HC or MF in the *STAR* citation. Current values for the price codes are given in the tables on page vii.

Documents on microfiche are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, Va. 22161.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the \* symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other report number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard \$4.00 price, for those documents identified by a # symbol.)

Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Document Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

(1) A microfiche is a transparent sheet of film 105 by 148 mm in size containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).



- Avail: DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.
- Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.
- Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.
- Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.
- Avail: BLL (formerly NLL) British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)
- Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).
- Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.
- Avail: U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of 50 cents each, postage free.
- Other availabilities. If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

## ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics and  
Astronautics  
Technical Information Service  
555 West 57th Street, 12th Floor  
New York, New York 10019

British Library Lending Division,  
Boston Spa, Wetherby, Yorkshire,  
England

Commissioner of Patents and  
Trademarks  
U.S. Patent and Trademark Office  
Washington, D.C. 20231

Department of Energy  
Technical Information Center  
P O. Box 62  
Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service  
ESRIN  
Via Galileo Galilei  
00044 Frascati (Rome) Italy

Fachinformationszentrum Energie, Physik,  
Mathematik GMBH  
7514 Eggenstein Leopoldshafen  
Federal Republic of Germany

Her Majesty's Stationery Office  
P.O. Box 569, S.E. 1  
London, England

NASA Scientific and Technical Information  
Facility  
P O Box 8757  
B.W.I Airport, Maryland 21240

National Aeronautics and Space  
Administration  
Scientific and Technical Information  
Branch (NST-41)  
Washington, D C. 20546

National Technical Information Service  
5285 Port Royal Road  
Springfield, Virginia 22161

Pendragon House, Inc.  
899 Broadway Avenue  
Redwood City, California 94063

Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20402

University Microfilms  
A Xerox Company  
300 North Zeeb Road  
Ann Arbor, Michigan 48106

University Microfilms, Ltd.  
Tylers Green  
London, England

U.S. Geological Survey  
1033 General Services Administration  
Building  
Washington, D.C. 20242

U.S. Geological Survey  
601 E. Cedar Avenue  
Flagstaff, Arizona 86002

U S Geological Survey  
345 Middlefield Road  
Menlo Park, California 94025

U.S. Geological Survey  
Bldg. 25, Denver Federal Center  
Denver, Colorado 80225



# NTIS PRICE SCHEDULES

## Schedule A

### STANDARD PAPER COPY PRICE SCHEDULE

(Effective January 1, 1982)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	\$ 4 00	\$ 8 00
A02	001-025	6 00	12 00
A03	026-050	7 50	15 00
A04	051-075	9 00	18 00
A05	076-100	10 50	21 00
A06	101-125	12 00	24 00
A07	126-150	13 50	27 00
A08	151-175	15 00	30 00
A09	176-200	16 50	33 00
A10	201-225	18 00	36 00
A11	226-250	19 50	39 00
A12	251-275	21 00	42 00
A13	276-300	22 50	45 00
A14	301-325	24 00	48 00
A15	326-350	25 50	51 00
A16	351-375	27 00	54 00
A17	376-400	28 50	57 00
A18	401-425	30 00	60 00
A19	426-450	31 50	63 00
A20	451-475	33 00	66 00
A21	476-500	34 50	69 00
A22	501-525	36 00	72 00
A23	526-550	37 50	75 00
A24	551-575	39 00	78 00
A25	576-600	40 50	81 00
	601-up	-- 1	-- 2

A99 - Write for quote

\*1 Add \$1 50 for each additional 25 page increment or portion thereof for 601 pages up

2 Add \$3 00 for each additional 25 page increment or portion thereof for 601 pages and more

## Schedule E

### EXCEPTION PRICE SCHEDULE

Paper Copy & Microfiche

Price Code	North American Price	Foreign Price
E01	\$ 6 50	\$ 13 50
E02	7 50	15 50
E03	9 50	19 50
E04	11 50	23 50
E05	13 50	27 50
E06	15 50	31 50
E07	17 50	35 50
E08	19 50	39 50
E09	21 50	43 50
E10	23 50	47 50
E11	25 50	51 50
E12	28 50	57 50
E13	31 50	63 50
E14	34 50	69 50
E15	37 50	75 50
E16	40 50	81 50
E17	43 50	88 50
E18	46 50	93 50
E19	51 50	102 50
E20	61 50	123 50

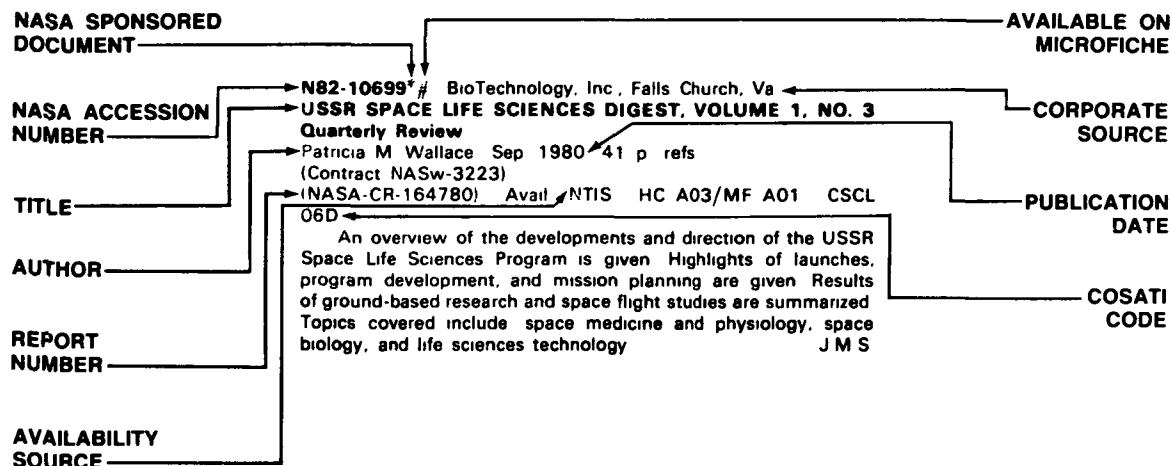
E-99 - Write for quote

N01 30 00 45 00

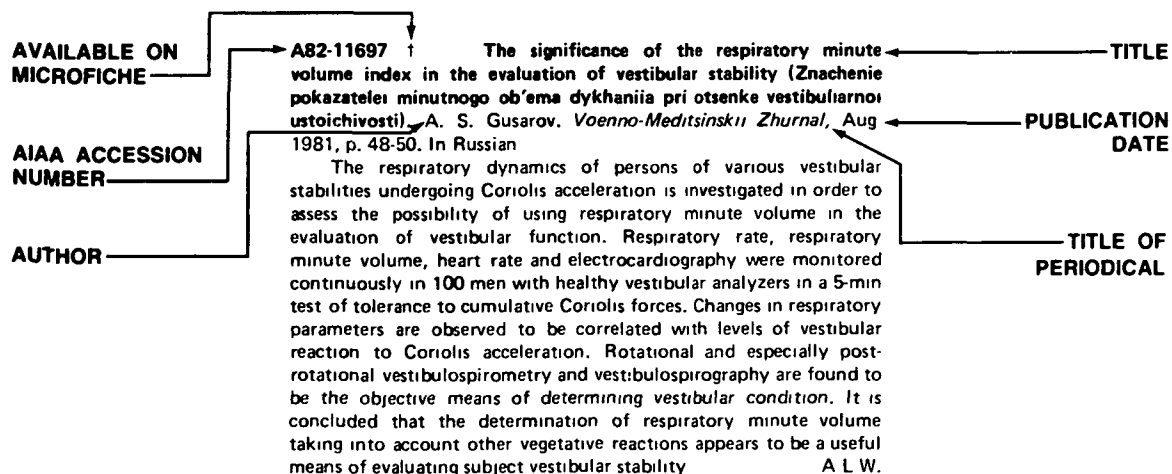
# TABLE OF CONTENTS

	Page
IAA ENTRIES (A82-10000) .....	305
STAR ENTRIES (N82-10000) .....	347
Subject Index .....	I-1
Personal Author Index .....	I-63

## TYPICAL CITATION AND ABSTRACT FROM STAR



## TYPICAL CITATION AND ABSTRACT FROM IAA





# AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 238)

NOVEMBER 1982

## IAA ENTRIES

**A82-38115** Clay and the origin of life. C Ponnamperna, A Shimoyama, and E Friebele (Maryland, University, College Park, MD) *Origins of Life*, vol 12, Mar 1982, p 9-40 118 refs

The possible roles of clay minerals in chemical evolution on the primitive earth are reviewed on the basis of available experimental evidence. Experiments involving the synthesis of biomonomers, including amino acids, purines, pyrimidines and carbohydrates, from gas mixtures in the presence of various clay minerals have shown the minerals to act by promoting the synthesis reactions without changing the direction of the reaction path, thus decreasing the time required for significant quantities of these molecules to accumulate. The capacity of clay minerals to adsorb and concentrate by several orders of magnitude these biomonomers from aqueous solution has also been demonstrated, with conditions for the adsorption process most favorable at low pH, and with basic molecules. Finally, it has been shown that clays may act to promote the polymerization of biological monomers by concentrating them, providing containment and a surface for immobilization, and protecting the reaction products, rather than by catalysis or direct participation in the reaction. A L W

**A82-38116** Formation of cyanate and carbamyl phosphate by electric discharges of model primitive gas. Y Yamagata and T Mohri (Kanazawa University, Kanazawa, Japan) *Origins of Life*, vol 12, Mar 1982, p 41-44 8 refs

The formation of cyanate and carbamyl phosphate, possible condensing agents in early chemical evolution, as a result of electrical discharges in a model of the primitive atmosphere consisting of a mixture of nitrogen, carbon dioxide and hydrogen is reported. Experiments were performed in a 5-l discharge vessel containing 100 ml of 0.2 M NaHCO<sub>3</sub> solution, 10 cm Hg nitrogen, 20 cm Hg carbon dioxide and from 5 to 30 cm Hg hydrogen. Determinations of cyanate formation according to the 690 nm absorption of the copper pyridine cyanate complex indicate maximum cyanate formation efficiency to be achieved at a hydrogen partial pressure of 10 cm Hg, corresponding to a largely oxidized gas mixture. The use of a phosphate solution in the discharge vessel with the same gas mixture is found to lead to the production of carbamyl phosphate, as indicated by the formation of ATP upon the incubation of the discharged solution with ADP and carbamyl phosphokinase. A L W

**A82-38117** Uracil synthesis via HCN oligomerization. A B Voet and A W Schwartz (Nijmegen, Katholieke Universiteit, Nijmegen, Netherlands) *Origins of Life*, vol 12, Mar 1982, p 45-49 27 refs

The identification of uracil among the products of the acid hydrolysis of HCN oligomers is reported. Oligomers were prepared from 1 and 0.1 M HCN solutions allowed to stand at room temperature for at least 6 months, then hydrolyzed in 5 M HCl at 110°C for 18 hours. Uracil was identified by high-pressure liquid chromatography following, although not prior to, acid hydrolysis, at concentrations corresponding to yields of 0.001% for the 1-M solution, and 0.005% for the 0.1-M solution. Experiments with oligomer hydrolysis in the presence of orotic acid have shown the uracil detected not to be a product of orotic acid decarboxylation, but to originate from at least two other precursor fractions. The results represent the first report of the production of a genetic code pyrimidine by HCN oligomerization. A L W

**A82-38118 \*** The radiolysis and racemization of leucine on proton irradiation. W A Bonner (Stanford University, Stanford, CA), R M Lemmon, and H E Conzett (California, University, Lawrence Berkeley Laboratory, Berkeley, CA) *Origins of Life*, vol 12, Mar 1982, p 51-54 19 refs Contract No W-7405-eng-48, Grant No NGL-05-020-582

D- and L-Leucine have been subjected to 39-55 percent radiolysis using 0.11 MeV protons, both with the proton beam passing through the sample or being

absorbed by it and with quenching the sample immediately on completion of irradiation or after a 21-day interval. Racemization was small (1.1-1.7 percent) and comparable in all cases, suggesting that radioracemization and secondary degradative effects were not important factors in the recent unsuccessful attempts to induce optical activity in DL-Leucine by partial radiolysis using 0.11 MeV longitudinally polarized protons. (Author)

**A82-38119** Polynucleotide replication coupled to protein synthesis - A possible mechanism for the origin of life. A G Mackinlay (New South Wales, University, Kensington, Australia) *Origins of Life*, vol 12, Mar 1982, p 55-69 22 refs

A speculative scheme is proposed for the origin of protein synthesis by the incorporation of amino acid linking into the process of polynucleotide replication. The scheme supposes polynucleotide replication to be accomplished by the condensation of aminoacyl-blocked oligonucleotides concomitant with the transfer of the blocking amino acid to an adjacent aminoacyl oligonucleotide, resulting in the formation of a peptide chain of random sequence. The polynucleotides are proposed to have been composed of repeating units similar to modern tRNAs, with internal complementarity. Selection of primitive tRNAs in which the amino acid and anticodon stem sequences were rotationally symmetrical could then have led to specific, anticodon-directed aminoacylation and the fixation of the genetic code. The end result of this evolution would have been a nucleoprotein structure resembling the ribosome, which would have been able to give rise directly to triplet-coded protein synthesis. Recent RNA sequence data are consistent with the proposed scheme. A L W

**A82-38120** Ambiguity and the evolution of the genetic code. R R Kocherlakota and N D Acland (Vincent Massey Collegiate Institute, Winnipeg, Manitoba, Canada) *Origins of Life*, vol 12, Mar 1982, p 71-80 25 refs

A scenario for the evolution of the genetic code by a word length alteration is proposed that relies on code ambiguity to minimize the time required for code changes. The model posits a primeval code containing only two bases (G and C) arranged in two-letter codons. The first alteration in the code that would probably have occurred would then be an alphabet alteration, in which the replacement of some G and C bases by A and U bases at a time when the environmental rate of change was high and ambiguity was favored would have expanded the vocabulary. Due to the high ambiguity, however, the vocabulary will begin to decline, and another alteration, this time a word length alteration to a value of three, could occur. The proposed model predicts the distribution of 4-blocs and 2-blocs in the genetic code, and determines the probable sites for code variations. A L W

**A82-38121 \*** Evolution of major metabolic innovations in the Precambrian. J Barnabas (Georgetown University Medical Center, Washington, DC, Ahmednagar College, Ahmednagar, India), R M Schwartz, and M O Dayhoff (Georgetown University Medical Center, Washington, DC) *Origins of Life*, vol 12, Mar 1982, p 81-91 91 refs Grants No NIH-GM-08710, Contract No NASw-3317

A combination of information on the metabolic capabilities of prokaryotes with a composite phylogenetic tree depicting an overview of prokaryote evolution based on the sequences of bacterial ferredoxin, 2Fe-2S ferredoxin, 5S ribosomal RNA, and c-type cytochromes shows three zones of major metabolic innovation in the Precambrian. The middle of these, which reflects the genesis of oxygen-releasing photosynthesis and aerobic respiration, links metabolic innovations of the anaerobic stem on the one hand and, on the other, proliferation of aerobic bacteria and the symbiotic associations leading to the eukaryotes. Those pathways where information on the structure of the enzymes is known are especially considered. Halobacterium and Thermoplasma (archaeobacteria) do not belong to a totally independent line on the basis of the composite tree but branch from the eukaryote cytoplasmic line. (Author)

**A82-38122 \*** Chemical evolution and the origin of life - Bibliography Supplement 1980. L G Pleasant (George Washington University Medical Center, Washington, DC) and C Ponnamperna (Maryland, University, College Park, MD) *Origins of Life*, vol 12, Mar 1982, p 93-114 484 refs Grants No NASW-3165, No NGR-21-002-317

**A82-38151 †** Changes in electrically neutral  $\text{Ca}^{2+}/\text{H}^{+}$  exchange in rat liver mitochondria following gamma irradiation (Izmenenie elektroneitral'nogo  $\text{Ca}^{2+}/\text{H}^{+}$  obmena v mitokhondriakh pecheni krys posle gamma-oblucheniia). B I Medvedev, G V Gogvadze, and A M Kuzin (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Radiobiologiya*, vol 22, May-June 1982, p 291-295 5 refs In Russian

**A82-38152 †** Changes in the relations of pyrimidine blocks in DNA of the hematopoietic system immediately following gamma irradiation of the animal (Izmeneniia v sootnosheniakh pirimidinovykh blokov DNK krovetvornoi sistemy neposredstvenno posle gamma-oblucheniia zhivotnogo). A A Vetchinkina and G A Kritskii (Akademiia Nauk SSSR, Institut Biokhimi, Moscow, USSR) *Radiobiologiya*, vol 22, May-June 1982, p 296-300 9 refs In Russian

**A82-38153 †** Study of the relation between the number of sulfhydryl groups and the level of lipid antioxidant activity in the organs of individual animals of different species (issledovanie svyazi mezhdu kolichestvom sulfhidril'nykh grupp i urovнем antiokislitel'noi aktivnosti lipidov organov u individual'nykh zhivotnykh raznykh vidov). E B Burlakova, G F Ivanenko, A A Konradov, V M Maksimov, and L N Shishkina (Akademiia Nauk SSSR, Institut Khimicheskoi Fiziki, Moscow, USSR) *Radiobiologiya*, vol 22, May-June 1982, p 301-306 20 refs In Russian

A study is presented of the possible relation between the two principal determinants of an organism's radiosensitivity - sulfhydryl groups and lipid antioxidant activity - in the sensitive organs of individual animals of different species. Determinations of thiol contents and lipid antioxidant activity were made simultaneously in the spleens and livers of individual rats, mice, golden hamsters and guinea pigs. Mathematical analysis reveals no linear or uniform correlation between the two parameters either in individual animals, or in animals of different species. It is thus concluded that the levels of sulfhydryl groups and lipid antioxidant activity represent different aspects of cellular metabolism, both of which play a significant role in determining radiation tolerance. A L W

**A82-38154 †** Optimization of the conditions of modified cell irradiation (Optimizatsiia rezhima modifitsirovannogo oblucheniia kletok). E K Palamarchuk (Akademiia Nauk SSSR, Fizicheskii Institut, Moscow, USSR) and S V Semenov (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Fiziko-Tekhnicheskikh i Radiotekhnicheskikh Izmerenii, Mendeleev, USSR) *Radiobiologiya*, vol 22, May-June 1982, p 307-311 6 refs In Russian

Results are presented of the optimization of a cell irradiation procedure on the basis of a dynamic mathematical model describing the effects of ionizing radiation on cells. Numerical integrations of model equations were performed on a BESM-6 computer to obtain the temporal characteristics of preliminary sensitizing and subsequent damaging radiation fluxes leading to the maximal death of cells of different initial radiosensitivities for a given damaging radiation dose. Model parameters were taken from experimental data obtained in HeLa tumor cell cultures. The possibility of enhancing the damaging effects of the main dose by repeated preliminary sensitization is considered, and the potential for the sensitization of only one type of cell in a population with heterogeneous radiosensitivities is noted. A L W

**A82-38155 †** Radiation-induced shortening of the life span of D. melanogaster. II - Sensitizing effects of 5-bromo-2-deoxyuridine (Radiatsionno-indutsirovannoe ukorochenie prodolzhitel'nosti zhizni D. melanogaster. II - Sensibiliziruiushchee deistvie 5-brom-2-dezoksiridina). A I Potapenko, A P Akif'ev, and V I Ivanov (Moskovskii Inzhenerno-Fizicheskii Institut, Akademiia Nauk SSSR, Institut Khimicheskoi Fiziki, Moscow, USSR) *Radiobiologiya*, vol 22, May-June 1982, p 318-322 12 refs In Russian

**A82-38156 †** Radiation damage and recovery of mouse T-cells. IV - Elimination of radiation-induced migration abnormalities in T-lymphocytes (Radiatsionnoe porazhenie i vosstanovlenie T-kletok myshei. IV - Likvidatsiia migratsionnykh defektov T-limfotsitov, indutsirovannykh oblucheniem). A A Iarilin, Iu N Anokhin, and E F Polushkina (Akademiia Meditsinskikh Nauk SSSR, Obninsk, USSR) *Radiobiologiya*, vol 22, May-June 1982, p 341-345 15 refs In Russian

**A82-38157 †** Effects of cAMP accumulation activators on certain stages of genome expression in cells upon acute radiation damage to the organism. III - Comparative study of the properties of RNA synthesized in a system of isolated liver and spleen cell nuclei from irradiated rats and animals having been treated with serotonin prior to irradiation (Vlianie aktivatorov nakopleniia tsAMF na otdel'nye etapy ekspressii genoma v kletkakh pri ostrom lucheveom porazhenii organizma. III - Sravnitel'noe izluchenie svoistv RNK, sintezirovannoi v sisteme izolirovannykh iader kletok pecheni i selezenki obluchennykh krys i zhivotnykh kotorym pered oblucheniem vvodili serotonin). B A Tsudzevich, L A Galkina, and N E Kucherenko (Kievskii Gosudarstvennyi Universitet, Kiev, Ukrainian SSR) *Radiobiologiya*, vol 22, May-June 1982, p 379-382 10 refs In Russian

**A82-38158 †** State of the lactate dehydrogenase reaction in the muscular tissue of irradiated animals (Sostoianie laktatdehidrogenaznoi reaktsii v myshechnoi tkani obluchennykh zhivotnykh). I V Savitskii and A A Mardashko (Odesskii Meditsinskii Institut, Odessa, Ukrainian SSR) *Radiobiologiya*, vol 22, May-June 1982, p 390-392 In Russian

The state of the reaction catalyzed by lactate dehydrogenase is studied as an indicator of oxidative metabolism in the muscles of irradiated animals. Lactate dehydrogenase activity, isoenzyme levels and lactate and pyruvate levels were determined in muscle taken from rats having undergone whole-body X radiation at a dose of 5.82 gram roentgen. A decrease in enzyme activity is found in cardiac muscle on the third day following irradiation, followed by an increase to a peak on the 15th day, while skeletal muscle showed a steady increase in activity to the seventh day. The activity of the second lactate dehydrogenase activity is observed to increase steadily in cardiac muscle, while in skeletal muscle the activity of the dominant fifth isoenzyme dropped after 1-3 days, then increased significantly by the seventh day. A slight increase in the lactate/pyruvate ratio is observed in both tissues. It is thus concluded that the processes of aerobic metabolism are not affected by penetrating radiation in the early stages, and that the role of anaerobic reactions increases only at the height of radiation sickness. A L W

**A82-38159 †** Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats (Izluchenie radiozashchitnoi effektivnosti gazovoi gipoksicheskoi smesi pri kombinirovannom radiatsionno-termicheskom porazhenii krys). R B Strelkov, N G Kucherenko, M V Radzhapova, V D Baranov, A I Drozd, and A I Britun (Akademiia Meditsinskikh Nauk SSSR, Obninsk, USSR) *Radiobiologiya*, vol 22, May-June 1982, p 392-395 11 refs In Russian

The possibility of using a breathing gas mixture containing 10% oxygen, which has been found effective in protecting against the harmful effects of ionizing radiation, to reduce the effects of combined radiation and thermal exposure is investigated. Rats were irradiated at total doses of 7.0, 8.5 and 10.0 gram roentgen while breathing either the hypoxic gas mixture or room air, then subjected to third-degree thermal trauma over 15% of their body surface. Hypoxia is observed to decrease the morbidity after 30 days of rats irradiated at all doses, with a dose reduction factor of 1.25, corresponding to the magnitude of that observed in rats subjected to radiation alone. Morbidity is higher, however, and mean lifetimes shorter, in rats exposed to both heat and radiation than in those undergoing radiation alone, even when both groups are subject to the hypoxic gas mixture during treatment. A L W

**A82-38160 †** Equivalent doses, dose rates and times of chronic exposure to ionizing radiation for various mammals (Ekvivalentnye dozy, moshchnosti dozy i vremena khronicheskogo oblucheniia ioniziruiushchei radiatsiei dlia razlichnykh mlekoпитаushchikh). V G Tiazheleva (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Radiobiologiya*, vol 22, May-June 1982, p 420-423 9 refs In Russian

A survey of data reported in the literature shows that three distinct stages of clinical, biochemical and morphological changes are manifested in mammals after chronic exposure to varying nonlethal doses of ionizing radiation. Listed in a detailed table are the characteristics for each of these three stages, such as changes in the electrocardiogram, blood, and endocrine system. The doses, dose rates and times of chronic exposure necessary to produce equivalent physiological effects characterized by each of the three stages are determined for humans, dogs and mice. N B

**A82-38161 †** Changes in the hemodynamics and efferent activity in the renal nerve with acute hypoxic hypoxia under the stabilization of perfusion pressure in carotid sinuses (Izmeneniia gemodinamiki i efferentnoi aktivnosti v pochechnom nerve pri ostroi gipoksicheskoi gipoksii v usloviakh stabilizatsii perfuzionnogo davleniia v karotidnykh sinusakh). O V Baziliuk (Akademiia Nauk Ukrainskoi SSR, Institut Fiziologii, Kiev, Ukrainian SSR) *Fiziologicheskii Zhurnal* (Kiev), vol 28, May-June 1982, p 285-289 9 refs In Russian

**A82-38162 †** Baroreflex regulation of hemodynamics under orthostatic effects /an investigation with a mathematical model/ (Barorefleksornaia regulatsiia gemodinamiki pri ortostaticheskikh vozdeistviiax /issledovanie na matematicheskoi modeli/). R D Gngorian (Akademiia Nauk Ukrainskoi SSR, Institut Kibernetiki, Kiev, Ukrainian SSR) *Fiziologicheskii Zhurnal* (Kiev), vol 28, May-June 1982, p 298-301 In Russian

Mathematical modeling is used to investigate the role of the baroreflex from the reflexogenic zones of the carotid sinuses and aortic arch compensating for disturbances to the central hemodynamics during simulations of changes in body position. Here, the head moves upward and downward from the horizontal to angles of up to 90 deg. It is shown that in compensation with antihypothetic compensation for an altered level of arterial pressure, compensation with orthostatism is effected with less baroreflex stress. By means of simulations on a model for the deafferentation of aortic and sinocarotid baroreflexes, it is shown that the method of deafferentation does not allow a quantitative evaluation of the relative regulatory roles of these processes. C R



**A82-38163** † The effect of repeated episodes of emotional stress on heart activity and the content of monoamines in the heart (Vliianie mnogokratno povtoriamogo emotsional'nogo stressa na deiatel'nost' serdtsa i sodержanie v nem monoaminov). I V Raitses (Ivano-Frankovskii Meditsinskii Institut, Ivano-Frankovsk, Ukrainian SSR) *Fiziologicheskii Zhurnal* (Kiev), vol 28, May-June 1982, p 302-305 10 refs In Russian

It is experimentally established that when rabbits are repeatedly subjected to emotional stress, changes occur in heart rhythm, with bradycardia alternating with tachycardia. In addition, the electrical activity of the heart is lowered, and ventricular extrasystoles are observed. The arrhythmia is found to be accompanied by an increase in the amount of noradrenaline and its precursors and of serotonin in the myocardium C R

**A82-38164** † Features of microcirculatory hemostasis and of the clotting and fibrinolytic properties of blood and the activity of the antioxidant system in people of various ABO blood groups (Osobennosti mikrotsirkulatsionnogo gemostaza, gemokoaguliatsionnykh i fibrinoliticheskikh svoistv krovi i aktivnost' antioksidantnoi sistemy u liudei razlichnykh grupp krovi sistemy AVO). G A Loban' (Poltavskii Meditsinskii Stomatologicheskii Institut, Poltava, Ukrainian SSR) *Fiziologicheskii Zhurnal* (Kiev), vol 28, May-June 1982, p 317-321 18 refs In Russian

**A82-38165** † The effect of helium on gas exchange and tissue respiration (Vliianie geliia na gazoobmen i tkanevoe dykhanie). V A Berezovskii, A I Nazarenko, and T N Govorukha (Akademiia Nauk Ukrainskoi SSR, Institut Fiziologii, Kiev, Ukrainian SSR) *Fiziologicheskii Zhurnal* (Kiev), vol 28, May-June 1982, p 353-358 31 refs In Russian

The various studies that have been carried out on the subject are surveyed. It is pointed out that many investigators believe that the effect of helium under normal pressure is more physical than pharmacological. On the basis of an analysis of these investigations, it is contended that helium is not neutral in relation to biological structure and that the effect of gases of the helium group on physiological processes is realized through a modification of the physical characteristics of the gaseous medium. It is also maintained that inert gases can exert a pharmacological effect by virtue of a change in cellular function brought about by interactions at the molecular level C R

**A82-38166** † The characteristics of hemodynamic shifts under physical stress at mountain elevations (K kharakteristike gemodinamicheskikh sdvigoov pri fizicheskoi nagruzke v usloviakh vysokogor'ia). L G Stepanenko (Akademiia Nauk Ukrainskoi SSR, Institut Fiziologii, Kiev, Ukrainian SSR) *Fiziologicheskii Zhurnal* (Kiev), vol 28, May-June 1982, p 361-363 8 refs In Russian

The changes that occur in central hemodynamic parameters in athletes at mountain elevations are investigated. The study is carried out on 13 oarsmen ranging in age from 18 to 26. The subjects are given a week to adapt to a temperature of 18 C and a relative humidity of 60% at elevations of 2200 m and 3500 m above sea level. The circulatory systems of the athletes are found to possess sufficient stability in relation to the lower content of oxygen in the blood, a consequence of the physical stresses to which they are subjected and the lower partial pressure of oxygen in the air. The changes in the central hemodynamic indicators at the two elevations are found to be adaptive, attesting the resistance of the athletes to the effects of hypoxia C R

**A82-38167** † Causes of high-altitude acute pulmonary edema (O prichinakh vysotnogo ostrogo oteka legkikh). E M Ismailov (Kirgizskii Meditsinskii Institut, Frunze, Kirgiz SSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiia*, May-June 1982, p 21-25 6 refs In Russian

Changes in functional systems and their possible participation in triggering mechanisms of high-altitude acute pulmonary edema were studied in experiments performed on male rabbits. The development of the high-altitude edema is discussed in relation to hypo- and hyper-proteinemia, hypo- and hyper-volemia, the blocking of alpha and beta adrenoreceptors, tropinization, glomectomy, increases in the central blood volume and pressure in pulmonary vessels, and increases in the permeability of these vessels B J

**A82-38168** † Early reaction of the hemopoietic organs depending on the condition of the peripheral M-cholinergic systems (Ranniia reaktsiia krovetvornnykh organov na stress-vozdetsvie v zavisimosti ot sostoiianiia perifericheskikh M-kholinoreaktivnykh sistem). Iu B Deshevoi *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiia*, May-June 1982, p 25-27 10 refs In Russian

Rats were subjected to six-hour immobilization during atropine block or aceclidine stimulation of the peripheral M-cholinergic receptors. It is shown that the injection of the agents produced no significant effect on the cellular reaction of the bone marrow and lymphoid organs to the stress. The injection of the agents did alter the character of the poststress lymphopenia and neutrophilia. It was found that atropine injection intensified while aceclidine injection reduced the degree of lymphopenia and neutrophilia B J

**A82-38169** † The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis (Sintez iadernykh i mitokhondrial'nykh DNK i RNK, sintez gema i globina v kostnom mozge krolikov pri stimulatsii eritropoeza). Iu D Goncharenko and A D Pavlov (Riazanskii Meditsinskii Institut, Ryazan, USSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiia*, May-June 1982, p 36-39 18 refs In Russian

Biosynthesis in bone marrow cells for periods of 4 and 24 hours after hypoxia and bloodletting was studied in experiments on rabbits. Four hours after hypoxia, the serum erythropoietin level increased and the synthesis of nuclear and mitochondrial RNA in the bone marrow was augmented, nuclear DNA synthesis increased by the 24th hour. It is found that erythropoietin produces a primary activating effect on the differentiation of erythropoietin-responsive cells and a secondary effect on the proliferation of erythropoietin-responsive cells and maturing erythroid cells. Changes in the synthesis of mitochondrial DNA, heme, and globin were found to occur in phases, which was apparently associated with the characteristics of bone marrow cell energy in the early and late periods of hypoxia B J

**A82-38170** † The effect of hypokinesia on the resistance of the heart to hypoxia (O vliianii gipokinezii na rezistentnost' serdtsa k gipoksii). E A Markova, V M Gandziuk, and I L Popovich (Ternopol'skii Meditsinskii Institut, Ternopol, Ukrainian SSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiia*, May-June 1982, p 46-50 19 refs In Russian

Experiments performed on white mice show that hypokinesia reduces the heart's resistance to acute hypoxia and changes the character of the effects of adrenaline and inderal on the heart's tolerance to hypoxia. These data are explained in terms of heterochronous disease in the synthesis of protein structures of the sarcolemma and myocardiocyte sarcoplasmic reticulum during hypokinesia. The cation pump capacity is reduced and a change occurs in the relation between the effect of adrenaline on two differently directed processes determining the efficacy of oxygen utilization by the mitochondria B J

**A82-38171** † The effect of denervation and tendotomy on oxidative phosphorylation in skeletal muscles of the rabbit and the resistance of phosphorylation to uncoupling agents (Vliianie denervatsii i tendotomii na oksislitel'noe fosforilirovanie v skeletnykh myshtsakh krolika i rezistentnost' fosforilirovaniia k razobshchaisushchim agentam). M A Shvets (Akademiia Meditsinskikh Nauk SSSR, Leningrad, USSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiia*, May-June 1982, p 76-78 10 refs In Russian

**A82-38177** † Experimental and clinical study of a new immunoregulatory preparation - thymalin (Eksperimental'noe i klinicheskoe izuchenie novogo immunoregulyatsionnogo preparata - timalina). V Kh Khavinson and V G Morozov *Voenno-Meditsinskii Zhurnal*, May 1982, p 37-39 In Russian

Results are presented of studies of the preparation, pharmacological properties and clinical applications of thymalin, a substance with immunoregulatory properties. Thymalin was first isolated from the thymus of the calf in 1971, by a procedure involving acetone and acetic acid extraction to produce a polypeptide complex containing thymarin as its active agent. Injection of thymalin into thymectomized animals was found to facilitate the recovery of T-lymphocyte levels and the immune response to thymus-dependent antigens. In clinical studies on patients with various conditions connected with a disturbance of the immune system, the administration of thymalin has been shown to aid healing or improve the condition in a majority of cases, associated with increases in the activity and quantity of T-lymphocytes and the normalization of various metabolic processes with few side effects. Thymalin is therefore recommended for a wide range of medical purposes, including the improvement of human performance under conditions where the state of the immune system determines tolerance to unfavorable environments A L W

**A82-38178** † The effectiveness of perspiration in a hot environment (Ob effektivnosti potootdeleniia v usloviakh zharkoi sredy). F T Eronin and N F Koshelev *Voenno-Meditsinskii Zhurnal*, May 1982, p 42, 43 8 refs In Russian

The relation of beverage consumption to the effectiveness of perspiration as a cooling mechanism in a hot environment is investigated. Measurements of perspiration, beverage consumption, sweat evaporation and heat loss were made in trained volunteers exercising in 34-34.5 C heat and drinking either water, a salt solution, or a vitamin solution. No significant differences were found, in any of the measured parameters with the exception of beverage consumption, for which unpleasant tastes and appearances associated with the salt and vitamin drinks are credited with reducing the amounts consumed. It is noted, however, that most of the sweat produced, amounting to as much as 1000 g/h, was evaporated from the skin or clothing, and was thus effective in body cooling A L W

**A82-38179** † Evaluation of vestibular function in flight personnel with chronic diseases during stable remission (K otsenke vestibuliarnoi funktsii u letnogo sostava s khronicheskimi zabolevaniiami v period stoikoii remis-

siii). E V Lapaev, O A Nakapkin, and O A Vorob'ev *Voenna-Meditsinskii Zhurnal*, May 1982, p 44-46 11 refs In Russian

The status of vestibular nystagmus and vestibulosensory reactions in persons with several chronic diseases not impeding flying activities is investigated. Tests of vestibular-autonomic tolerance to intermittent Coriolis acceleration, nystagmus upon undamped sinusoidal rotation, postrotational nystagmus, counter-rotation, cupulometry and caloric stimulation of the labyrinth were performed on flight personnel with various diseases while their respective diseases were in stable remission. Definite changes in vestibular function are observed for patients with several conditions not preventing flying, most notable those with diseases of the nervous system and cochlear neuritis. It is thus recommended that flight personnel with histories of such conditions be evaluated by combined studies of vestibulo-autonomic, nystagmic and sensory reactions. A L W

**A82-38180 † Some characteristics of the diurnal rhythm of physiological functions of sailors in the tropics (Nekotorye osobennosti sutochnogo ritma funktsii organizma u moriakov v tropikakh).** V V Berdyshev and G F Gngorenko *Voenna-Meditsinskii Zhurnal*, May 1982, p 47, 48 In Russian

The diurnal patterns of central nervous system, thermoregulatory, cardiovascular, respiratory, adrenal cortical, vitamin C metabolic and mental and physical work capacity parameters were investigated in sailors during prolonged cruises in the tropics. Evaluations prior to sailing show the patterns of 20 healthy sailors to be essentially similar to those of groups in other climatic regions, with most indicators reaching their maximal values at 1200 and 1600 hours in the absence of a daytime nap, and a two-peak structure present when a nap is taken after the midday meal. In the initial period of the cruise, during the period of acute adaptation, the average levels of the various parameters are observed to be shifted, and diurnal rhythms exhibit a pronounced peak in the hot afternoon hours while the daily curve was flattened. Prolonged exposure to tropical conditions leads to changes in the activity of the various systems, including an overall improvement in cardiovascular functioning, a reduction in urinary 17-ketosteroid and vitamin C excretion, an increase in work capacity and vascular resistance, and a pronounced decrease in the markedness of the functional peak in the hot hours of the day. A L W

**A82-38268 Circadian changes in resting heart rate and body temperature, maximal oxygen consumption and perceived exertion.** I E Faria and B J Drummond (California State University, Sacramento, CA) *Ergonomics*, vol 25, May 1982, p 381-386 20 refs

The effect of time of day on maximal oxygen uptake, heart rate, body temperature, and the rated perceived exertion (RPE) during exercise was studied over a 24 hr day-night cycle. Thirty-one subjects were randomly administered a treadmill test on 24 separate occasions, 48 hr apart, and the RPE determined at heart rates of 130, 150 and 170 beats/min. Oral temperature and heart rate exhibited parallel variance and were lower in the morning than afternoon or evening, while the maximal oxygen uptake was stable throughout 24 hr. Heart rate and RPE varied nonlinearly, with the RPE being higher at 02 00 and 04 00 hr than at 20 00, 22 00 and 24 00. N B

**A82-38325 Rotating shift work schedules that disrupt sleep are improved by applying circadian principles.** C A Czeisler (Center for Design of Industrial Schedules, Boston, Harvard University, Cambridge, MA), M C Moore-Ede (Harvard University, Boston, MA), and R M Coleman (Stanford University, Stanford, CA) *Science*, vol 217, July 30, 1982, p 460-463 33 refs

The possibility of easing the transition of circadian rhythms to different schedules was examined in terms of swing shift worker schedules which were shifted by a phase delay process. A control group of employees, numbering 33, changed shifts once per week while the experimental group, with 52 subjects, followed a phase delay schedule with a complete shift change only once every 21 days. The program continued for 9 mos, after which the previous complaint rate concerning abrupt changes of shift dropped from 90 to 20% of the workers rotating shifts. Productivity, health, and turnover rates improved among the phase shift delay subjects, indicating that work shift schedules which rotate by phase delay with lengthy intervals between each rotation are more compatible with the human circadian rhythm system than are abrupt changes in schedules. M S K

**A82-38534 † Selecting optimal conditions for heart conservation in weak aldehyde solutions by using mathematical methods of experimental design (Vybor optimal'nykh rezhimov konservirovaniia serdtsa slabymi rastvorami aldegidov s ispol'zovaniem matematicheskikh metodov planirovaniia eksperimenta).** V I Tel'pukhov, V A Shepelev, and A N Lisenkov (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 106-109 10 refs In Russian

Heart conservation experiments were carried out, in vitro and in vivo, on 200-300-g rats using weak aldehyde solutions, and a multiple-factor experiment was used to optimize the conditions of heart conservation. A regression model was obtained for the principal effects involved, and aldehyde concentrations for conservation in vitro and in vivo as well as the amount of aldehyde in ml per 100 g of animal weight were singled out as the most essential factors. The optimum

values of these factors were then determined by using a two-level second-order experimental design, these values are aldehyde concentrations of 0.037 and 0.03% for in vitro and in vivo heart conservation, respectively, with 0.65 ml of aldehyde used per 100 g of animal weight. V L

**A82-38535 † RNA-content distribution of cells from the normal and atherosclerotic human aorta (Raspredelenie po sodержaniu RNK kletok, vydelennykh iz normal'noi i povlechennoi v ateroskleroz aorty cheloveka).** V A Kosykh, A N Orekhov, and V S Repin (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 104-106 7 refs In Russian

The distributions of RNA contents in cells from the intima and media of normal and atherosclerotic human aortas are investigated. Measurements of red fluorescence from acridine-orange-stained nucleic acids were made by a flow cytometer in cells isolated from 15 men aged 40 to 53 within 3 hours of death by means of enzymatic dispersion. Plots of the intensity of red fluorescence against light scattering, an indicator of cell size, reveal the presence of two subpopulations of cells in normal and atherosclerotic arteries. Cells of subpopulation A, with low RNA levels, are smaller than those in subpopulation B, with high RNA levels. Intimal cells from vessels with atherosclerotic lesions are observed to exhibit a greater proportion of subpopulation A cells than those from normal vessels, while the relative proportions of the two subpopulations in the medial cells remained the same. It is proposed that the cells of subpopulation A are less active than cells of subpopulation B. A L W

**A82-38536 † Separation of bone marrow cells in mice by free-flow electrophoresis (Razdelenie kletok kostnogo mozga myshei metodom preparativnogo elektroforeza).** V M Kotelnikov, V P Reshchikov, N M Fertukova, O A Gurevich, N A Rudneva, and G I Kozinets (Ministerstvo Zdravookhraneniia SSSR, Institut Gematologii i Perelivaniia Krovi, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 102-104 12 refs In Russian

**A82-38537 † Study of RNA synthesis rate and DNA content in the myocardium of new-born rats during adaptation to high-altitude hypoxia (Izuchenie intensivnosti sinteza RNK i sodержaniia DNK v miokarde novorozhdennykh krysov v protsesse adaptatsii k vysokoi gipoksii).** V A Kononova (Kirgizskii Nauchno-Issledovatel'skii Institut Akusherstva i Pediatrits, Frunze, Kirgiz SSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 100-102 12 refs In Russian

**A82-38538 † The dynamics of quantitative changes of RNA in rat cerebellum Purkinje cells in different functional states (Dinamika koihestvennykh izmenenii RNK v kletkakh Purkin'e mozghechka krysa pri razlichnykh funktsional'nykh sostoianiakh).** Z A Mikeladze (Akademiia Nauk SSSR, Institut Biologii Razvitiia, Moscow, USSR, Tbilisskii Gosudarstvennyi Universitet, Tbilisi, Georgian SSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 94-96 12 refs In Russian

UV cytophotometry was used to study the time-dependent effect of vestibular stimulation on RNA content in the Purkinje cells of the rat cerebellum. The rats were placed in narrow boxes which were rotated horizontally (60 rpm) for an hour. In order to evaluate the effects of stress and hypoxia, the RNA content was examined in immobilized animals placed in the same boxes without rotation. Rhythmic quantitative changes in RNA content in the cytoplasm and nucleus of Purkinje cells were observed upon vestibular stimulation of the cerebellum function. In the nucleolus, changes in the RNA content were less pronounced. Periodic quantitative changes in the RNA content in the cytoplasm, nucleus, and nucleolus of Purkinje cells were statistically significant in the majority of the rats, but weakly pronounced. B J

**A82-38539 † The influence of the GABA-receptor blocker bicuculline on the effects of fenibut and diazepam (Vliianie blokatora GMAK-retseptorov bikukullina na efekty fenibuta i diazepam).** L Kh Allikmets, L K Riago, and A M Nurk (Tartuski Gosudarstvennyi Universitet, Tartu, Estonian SSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 64, 65 9 refs In Russian

Fenibut (100 mg/kg) was found to suppress motility and emotional reactivity but did not show any antiaggressive properties, whereas diazepam (2.5 mg/kg) increased motility and decreased aggressiveness in rats. Bicuculline (1.25 mg/kg) by itself did not cause any behavioral changes, though it was capable of counteracting the effects of diazepam and potentiating those of fenibut. Bicuculline attenuated the rise in GABA but did not affect the increased content of HVA and DOPAC after administration of fenibut. B J

**A82-38540 † Enzymes that detoxify active forms of oxygen and lipoperoxide in experimental ischemia and myocardial infarction (Fermenty detoksikatsii aktivnykh form kisloroda i lipoperekisei pri eksperimental'noi ishemii i infarkte miokarda).** V Z Lankin, A Kh Kogan, A L Kovalovskaia, G G Konvalova, D R Rakita, A N Kudrin, and A M Vikhert

(Akademii Meditsinskikh Nauk SSSR, I Moskovskii Meditsinskii Institut, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 58-60 15 refs In Russian

The variation in the activity of superoxide dismutase, glutathione peroxidase, and glutathione-S-transferase was studied in experimental ischemia and myocardial infarction produced in rats. The activity of the first two enzymes mentioned decreased drastically two to fifteen minutes after ligation of the coronary artery and remained at a reduced level during the observation period (14 days). The activity of glutathione-S-transferase in the infarcted zone of the myocardium significantly decreased only by the third day of the experiment. The activity of glutathione peroxidase in the blood of patients with acute myocardial infarction rose more than 1.5-fold

B J

**A82-38541 † Migration kinetics of hemopoietic stem cells in mice after severe mechanical trauma (Kinetika migratsii stvolovykh krovetvornykh kletok u myshei posle tiazhelei mekhanicheskoi travmy).** V K Kulagin and V N Aleksandrov (Voenno-Meditsinskaya Akademiya, Leningrad, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 45, 46 7 refs In Russian

**A82-38542 † Comparative study of systemic hemodynamics in normotensive and hypertensive rats (Sravnitel'naya otsenka sistemnoi gemodinamiki u normotenzivnykh i gipertenzivnykh kryss).** Sh I Ismailov (Akademii Meditsinskikh Nauk SSSR, Moscow, USSR) and O S Medvedev (Andizhanskii Meditsinskii Institut, Andizhan, Uzbek SSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 38-40 9 refs In Russian

**A82-38543 † The protective role of the forebrain with respect to pathological cardiac reflexes (O 'zashchitnoi' roli perednykh otdelov golovnoy mozga v otnoshenii patologicheskikh refleksov na serdtse).** G E Samonina (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 32-34 16 refs In Russian

A study is presented of the relative importance of the facilitating and inhibitory influences of the hypothalamus on adaptive and pathological cardiac reflexes. The adaptive cardiocardiac reflex was elicited by the expansion of a small balloon in the right auricle and the pathological viscerocardiac reflex was elicited by the stretching of the urinary bladder in frogs undergoing electrical stimulation of the hypothalamus. Hypothalamic stimulation is found to either enhance or reduce the magnitude of the bradycardia produced by the viscerocardiac reflex and the tachycardia produced by the cardiocardiac reflex. Facilitation is observed in 27% of the cases of simultaneous and 31% of the cases of delayed reaction to the cardiac stimulus, but in only 23% of simultaneous and 12% of delayed reactions to the visceral stimulus. Reversal of the direction of the reflex was also observed. The greater inhibitory influence of the hypothalamus on the pathological reflex is thus seen as an instance of the physiologically beneficial control of lower nervous centers by higher ones

A L W

**A82-38544 † Local cerebral blood flow dynamics during experimental ischemia (Dinamika lokal'nogo mozgovogo krovotoka pri eksperimental'nom ishemicheskom insulte).** L N Dorokhova, V A Sorokoumov, and V A Tsyrlin (I Leningradskii Meditsinskii Institut, Leningradskii Nauchno-Issledovatel'skii Institut Kardiologii, Leningrad, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 29-32 6 refs In Russian

Changes in blood flow characteristics in various regions of the cerebral cortex during experimentally induced local ischemia are investigated. Experiments were performed on anesthetized cats undergoing ischemia produced by the occlusion of the middle cerebral artery. Recordings of local cerebral blood flow made by the hydrogen clearance method in 16 areas of the brain at various times after the ischemic insult show marked changes in the cerebral blood flow patterns, including enhancements and reductions in different areas, in both cerebral hemispheres. In addition, a disturbance in the mechanisms of cerebral blood flow regulation is noted in tests involving the artificial elevation of systemic blood pressure

A L W

**A82-38545 † Alterations in heart work rhythm during hyperactivation of the anterior amygdaline nucleus (Izmenenie ritma serdechnoi deiatel'nosti pri giperaktivatsii perednego amigdal'nogo yadra).** G N Kryzhanovskii (Akademii Meditsinskikh Nauk SSSR, Moscow, USSR) and Iu I Pivovarov (Irkutskii Meditsinskii Institut, Irkutsk, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 26-29 16 refs In Russian

**A82-38546 † The impulse activity of neurons in the nodose ganglion during acute hemodynamic and respiratory disorders (Impul'snaya aktivnost' neuronov uzlovatogo gangliia pri ostryykh narusheniiaakh gemodinamiki i dykhanii).** G I Kositskii, S D Mikhailova, and T M Semushkina (II Moskovskii Meditsinskii Institut, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 24-26 8 refs In Russian

**A82-38547 † The role of central gray matter in the activation of antipain systems of the rat's brain under stress (Rol' tsentral'nogo serogo veshchestva v aktivatsii protivobolevykh sistem mozga kryss pri stresse).** E O Bragin, G F Vasilenko, and R A Durnin (Tsentral'nyi Nauchno-Issledovatel'skii Institut Refleksoterapii, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 22-24 6 refs In Russian

Electrolytic lesions of central gray matter (CGM) were induced in rats. Analgesia produced by stress (foot shock) was found to be significantly reduced in the lesioned rats. The baseline pain threshold measured by the hot-plate method was significantly longer in CGM-lesioned rats. The baseline tail-flick latency was unaffected by the lesions. The role of CGM in the regulation of pain sensitivity in rats is considered

B J

**A82-38548 † An improved apparatus for venous occlusion plethysmography (Usovershenstvovannaya ustanovka dlia venoznoi okklyuzionnoi pletizmografii).** L F Borisova (Akademii Meditsinskikh Nauk SSSR, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 17, 18 7 refs In Russian

An apparatus for venous occlusion plethysmography has been designed which allows the simultaneous recording of changes in the volume of a limb segment, and the rate and logarithm of these changes as the venous occlusion is effected and removed. The apparatus is based on a plethysmograph using a mercury-rubber sensor mounted on the limb to detect changes in limb size according to variations in sensor resistance, which depends on its length. Following amplification, plethysmographic signals are transmitted to a three-channel recording device directly, to obtain the plethysmographic curve, and after passage through a signal differentiator (an operational amplifier) and a logarithmic signal amplifier, to obtain the time rate of change and the logarithm of the limb volume, respectively. The device may be useful in studies of peripheral circulation in healthy subjects and in persons with disturbances in peripheral circulation

A L W

**A82-38549 † Two phases of the inotropic effect of adrenaline - The calcium dependence (Dve fazy ionotropnogo deistviia adrenalina Kal'tsievaya zavisimost').** L V Sorokin, O P Iurchenko, and T M Turpaev (Akademii Nauk SSSR, Institut Biologii Razvitiia, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 15-17 12 refs In Russian

The biphasic inotropic effect of adrenaline administered for a long time (30 minutes) was studied on a frog ventricular strip. The decrease in contraction amplitude became more pronounced as the intensity of Ca-ion introduction into myocardial cells was potentiated by the increased frequency of stimulation and calcium or adrenaline concentrations were increased. Mechanisms of the adrenaline-induced decrease in contraction amplitude are examined

B J

**A82-38550 † The influence of the speed of blood flow in the carotid artery on the hematocrit of the blood being delivered to the brain (Vliianie skorosti krovotoka v sonnoi arterii na gematokrit krovi, raspredeleniia na golovnomu mozgu).** G I Mchedlishvili and M N Varazashvili (Akademii Nauk Gruzinskoi SSR, Institut Fiziologii, Tbilisi, Georgian SSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 12-14 8 refs In Russian

**A82-38551 † The cholinergic nature of hypothalamo-cortical excitatory influence (Kholinergicheskaya priroda gipotalamo-kortikovykh vzbuzhdaushchikh vlianii).** S N Kozhechkin (Akademii Meditsinskikh Nauk SSSR, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 10-12 13 refs In Russian

The excitatory effect of electrical stimulation of the ventrocaudal area of the lateral hypothalamus on optical-cortex neurons in rabbits was observed mainly in cells whose activity increased under the effect of acetylcholine applied microionophoretically. Atropine applied microionophoretically decreased or completely blocked the hypothalamic excitatory effect as well as that of acetylcholine. Atropine did not change the depressing effect of the rostral region of the lateral hypothalamus on the neural cortical activity. It is found that the hypothalamo-cortical excitatory relationships are M-cholinergic in nature

B J

**A82-38552 † Evidence of an immune mechanism of enzyme-hemostasis regulation (Dokazatel'stvo immunnogo mekhanizma regulatsii fermentov gemostaza).** N N Tsybikov and B I Kuznik (Chitinskii Meditsinskii Institut, Chita, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, May 1982, p 8, 9 5 refs In Russian

Direct evidence was discovered of the immune regulation of homeostasis in the blood coagulation system. Autoantibodies that inactivate the appropriate enzymes were isolated from the plasma gamma-fraction and serum of nonimmunized animals by affinity chromatography on the sorbents Ila- and Xa-sepharose. The obtained immunoglobins displayed antienzymatic activity in pure systems and revealed a cross reaction in HIT

B J

**A82-38553 † The detection of premorbid states and cardiovascular diseases during medical examinations of seamen (Vyavleniye predbolez-**

nennykh sostoianii i boleznei serdechno-sosudistoi sistemy pri meditsinskom osvidetel'stvovanii plyvsostava). L I Aleinikova, A N Gobzhel'ianov, I I Saltykov, A G Putienko, and V P Krivunchenko (Basseinovaia Bol'nitsa na Vodnom Transporte, Odessa, Ukrainian SSR) *Sovetskoe Zdravookhranenie*, no 5, 1982, p 48-50. In Russian

**A82-38554 †** Diagnosis and organization of the therapy of patients with disorders of blood circulation in the brain (K voprosu diagnostiki i organizatsii lecheniia bol'nykh s narvsheniem mozgovogo krovoobrashcheniia). V A Gusev, R L Kuvshinova, Z A Markova, V R Rubtsova, and A V Shishkina (Riazanskii Meditsinskii Institut, Riazan, USSR) *Zdravookhranenie Rossiiskoi Federatsii*, no 5, 1982, p 35, 36. In Russian

**A82-38555 †** A study of temporary absences from work arising from disorders of the circulatory system (Nekotorye voprosy izucheniia vremennoi netrudospobnosti pri bolezniakh sistemy krovoobrashcheniia). N A Frolova, G S Mazanov, A N Branskaia, V L Krasnenkov, and T D Kozlova (*Zdravookhranenie Rossiiskoi Federatsii*, no 5, 1982, p 30-33. In Russian

The medical records of persons who missed work in a particular region because of illnesses of the circulatory system are reviewed. The timeliness and accuracy of the diagnosis in each case are studied, along with the reasons for the diagnosis. Hypertonic and ischemic disorders are found to be the most common. The incidence of the illnesses, as reflected in time lost from work, is found to be lower among workers on kolkhozes and sovkhoses than among workers in urban areas. Those absent from work for the longest periods tended to be younger women and older men. The importance of an early diagnosis and of hospitalization is stressed. C R

**A82-38556 †** The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice (Vlianie dlinnovolnogo ul'trafioletovogo izlucheniia na indutsirovannuiu tsiklofosfamidom chastotu khromosomnykh aberratsii v kletkakh kostnogo mozga myshei). V S Zhurkov, V P Il'in, and I I Prokopenko (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Tsitologia i Genetika*, vol 16, Mar-Apr 1982, p 6-9. 14 refs. In Russian

**A82-38557 †** Morphological and functional factors contributing to a hypertonic heart (O nekotorykh morfofunktsional'nykh osnovakh formirovaniia 'gipertonicheskogo serdtsa'). V A Frolov and G A Drozdova (Universitet Druzhby Narodov, Moscow, USSR) *Arkhiv Patologii*, vol 44, no 5, 1982, p 35-41. 8 refs. In Russian

The changes in heart activity that occur at various stages of arterial hypertension are investigated from a morphological and functional viewpoint. Experiments are carried out on 239 chinchilla rabbits ranging in weight from 3.0 to 3.2 kg. Three stages are discerned in the development of a hypertonic heart. The first stage (from the first to the fourth week) is a preparatory stage leading to compensation, the effects of overexertion manifest themselves and compensatory and adaptive changes begin. The second stage, from the sixth to the 10th week, is the compensation stage. Here, the process is stabilized and adaptive changes are strikingly apparent in the cardiac muscle, in particular, hypertrophy of the myocardium. The third stage, from the 22nd to the 52nd week, is one of decompensation. Here, destructive processes develop in the myocardium, and the contractile ability of the myocardium begins to weaken. C R

**A82-38558 †** Ultrastructural changes in the brains of rats subjected to acute emotional stress (Ul'trastrukturnye izmeneniia mozga krysa pri perennostikh ostroie emotsional'noie perenapriazheniie). N N Bogolepov, L B Verbitskaia, T I Belova, and K V Sudakov (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Zhurnal Nevropatologii i Psikhatrii im S S Korsakova*, vol 82, no 5, 1982, p 51-54. 7 refs. In Russian

Changes in neuronal and synaptic ultrastructure in the parietal region of the cerebral cortex, the reticular formation of the midbrain and the pons varlii following acute emotional stress are studied in rats undergoing 2 hours of immobilization. Electron microscopic examination immediately, 1 hour and 24 hours after the immobilization procedure reveals two types of ultrastructural changes. The first type, including peripheral chromatolysis of the nerve cells and cytoplasmic changes including mitochondrial swelling, vacuolization and changes in the smooth endoplasmic reticulum, are of a functional, transitory character, being significantly reduced 24 hours after immobilization. The second type, on the other hand, are of a more pronounced and resistant nature, including vacuolization of the neuronal nuclei and marked changes in the synapses, and persist for at least 24 hours. It is suggested that these changes may represent the morphological basis for cerebrovisceral disorders developing after immobilization stress. A L W

**A82-38559 †** The thermal pulsation method in the study of several physiological mechanisms of the brain stem (Metod teplovoi pul'satsii v issledovanii nekotorykh fiziologicheskikh mekhanizmov mozgovogo

stvola). V A Likhtenshtein (Dagestanskii Meditsinskii Institut, Makhachkala, USSR) *Zhurnal Nevropatologii i Psikhatrii im S S Korsakova*, vol 82, no 5, 1982, p 44-50. 14 refs. In Russian

Results of physiological studies made using the application of thermal pulses to the body surface in the nasolabile region are discussed. Thermal pulsations have been observed to induce sleep, and thereby ameliorate neurotic and neurotic-like conditions. The somnogenic power of thermal pulsations has been noted to be enhanced when the pulsations are synchronized with respiration, a fact explained by the physiological thermopulsations normally experienced by the nasal thermoreceptors during the course of the respiratory cycle. A hypotensive effect of clinical significance has also been noted during thermal pulsation, which is attributed to local vascular dilation, along with an increase in peripheral blood flow. Results thus demonstrate the close relationship of thermoregulation with the mechanisms of sleep regulation, respiratory functions and the regulation of blood flow. A L W

**A82-38560 †** The concentration of adenyli nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress (Soderzhanie adenilovykh nukleotidov i kreatinfosfata v polushariakh golovnogo mozga pri razlichnykh proiavleniiakh stressa). V V Davydov, V P Tverdokhlib, and V S Iakushev (Orenburgskii Meditsinskii Institut, Orenburg, USSR) *Zhurnal Nevropatologii i Psikhatrii im S S Korsakova*, vol 82, no 5, 1982, p 31-34. 16 refs. In Russian

Changes in cerebral high-energy phosphate metabolism occurring during various manifestations of stress are investigated using as a model the development of cardiac necrosis in previously stressed rats. A marked increase in creatine phosphate levels is found in rats subjected to both emotional-nociceptive stress and cardiac necrosis with respect to intact animals and those subjected to stress alone, while creatine levels fell sharply. Whereas ATP levels remained constant as a result of stress, cardiac necrosis led to a steady decrease in ATP levels, accompanied by an increase in the levels of its decomposition products. Results indicate the importance of creatine and creatine phosphate in maintaining cerebral ATP levels, and suggest a possible pathogenetic mechanism for neurotic-like conditions observed in many visceral ailments. A L W

**A82-38561 †** Prostaglandins and regulation of cerebral circulation under conditions of the altered gaseous composition of the blood (Prostaglandiny i regulatsiia mozgovogo krovoobrashcheniia pri izmeneniakh gazovogo sostava krovi). E S Gabnelian and E A Amroian (Akademiia Meditsinskikh Nauk SSSR, Vestnik, no 5, 1982, p 38-45. 13 refs. In Russian

**A82-38562 †** An attempt at the classification of 'patient pharmacokinetic capacities' (Popytka tipizatsii 'farmakokinetcheskikh sposobnostei bol'nykh'). L B Nurmand and L S Mekhlane (Tartuskii Gosudarstvennyi Universitet, Tartu, Estonian SSR) *Farmakologiya i Toksikologiya*, vol 45, May-June 1982, p 79-82. 14 refs. In Russian

The individual pharmacokinetic capacities of a group of patients are studied on the basis of the rates for the biotransformation of a single drug. Levels of the barbiturate barbamyli (Amobarbital) in the blood were determined at hourly intervals for 6 hours following ingestion on an empty stomach in 42 female patients with schizophrenia, seven with chronic alcoholism and three healthy women. Calculations of the absorption constant, distribution coefficient, residence half-life, total clearance and elimination constant of the substance on the basis of the concentration data allow the classification of the patients into three pharmacokinetic types: average, slow and rapid. The pharmacokinetic types are found to be related to patient age, the duration of drug therapy, and especially the efficacy of drug treatment, indicating the usefulness of pharmacokinetic capacities in the prediction of the effectiveness of pharmacotherapy. A L W

**A82-38563 †** The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones (Vlianie kaliia orotata na obmen riada vitaminov v organizme bol'nykh s perelomami dlennykh trubchatykh kostei). R S Kuzdenbaeva, U Sh Shaikhiev, B A Utegenov, and S A Rystina (Aktubinskii Meditsinskii Institut, Aktubinsk, USSR) *Farmakologiya i Toksikologiya*, vol 45, May-June 1982, p 76, 77. In Russian

**A82-38564 †** Sword and scalpel (Mech i skal'pel'). A Kholmakaia *Khimiia i Zhizn'*, May 1982, p 36-39. In Russian

A description is given of a laser knife developed in the Soviet Union known as Scalpel-1, an optical quantum generator using CO<sub>2</sub>. The knife is designed for use in operations on the stomach and intestines. In discussing the advantages of lasers in medicine, it is pointed out that they eliminate bleeding during operations. An account is also given of the way in which lasers can be used in skin transplants. They can also be used in cosmetic procedures, such as removing tattoos. C R

**A82-38565 †** Use of the thermovision method in the prophylactic examination of polar workers (Ispol'zovanie teplovizionnogo metoda pri

**provedeni profilakticheskikh osmotrov rabochikh Zapol'ia'ia).** A. V. Ivanov, B. A. Skripal', V. F. Tarov, and G. P. Gagarin (Ministerstvo Zdravookhraneniia RSFSR, Nauchno-Issledovatel'skaia Laboratoriia Kompleksnykh Problem Gigieny Truda i Klinikoi Professional'nykh Zabolovaniu, Kirovsk, USSR) *Gigiena Truda i Professional'nye Zabolovaniia*, May 1982, p. 56, 57. In Russian

The potential of thermography for the early detection of neurovascular and osteoarticular disorders in the massive prophylactic examination of workers is evaluated in workers of the arctic metal-working industry. Thermograms of the hands and the wrist, elbow and shoulder joints were recorded photographically in 106 workers concurrently undergoing clinical and physiological studies. About 30% of the workers exhibited asymmetries in skin thermotopography and a reduction in thermal emission from the distal portions of the phalanges, which were often but not always accompanied by complaints of numbness and elevated sensitivity to cold. Similar disorders were found in fitters and molders, indicating the changes in skin thermotopography to be a result of the cold microclimate rather than vibration. Asymmetries in thermal emission from the large joints were observed in about 57% of the molders, corresponding to previously detected or unnoticed osteoarticular pathologies. Results thus support the use of thermography for the early detection of disorders induced by the combined effects of factors in the work environment. A L W

**A82-38567 † Physiological and hygienic analysis of the response of young truck drivers to their work load (Fiziologo-gigienicheskii analiz reaktsii organizma molodykh voditelei gruzovogo avtotransporta na proizvodstvennuiu nagruzku).** A. I. Klimenko, V. Ia. Umanski, Iu. E. Liakh, and L. L. Pshedromirskii (Donetskii Meditsinskii Institut, Donetsk, Ukrainian SSR) *Gigiena Truda i Professional'nye Zabolovaniia*, May 1982, p. 24-27. 9 refs. In Russian

**A82-38568 † The effect of certain characteristics of work motions on the tolerance of hand muscles to static exertions (Vlianie nekotorykh kharakteristik rabochikh dvizhenii na vynosivost' myshts ruk k staticheskomu usiliu).** N. A. Kokhanova, E. F. Shardakova, V. V. Elizarova, and F. A. Kolosova (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Gigiena Truda i Professional'nye Zabolovaniia*, May 1982, p. 15-18. 10 refs. In Russian

**A82-38569 † The conditions attending muscular strain in work involving only a few types of movements (Uslovia vozniknoveniia myshechnykh perenapriazhenii pri lokalnoi fizicheskoi rabote).** Iu. V. Moikin, N. Iu. Tarasenko, B. E. Anan'ev, S. G. Kropivko, D. N. Kriukova, A. I. Mironov, V. V. Piskunov, A. C. Poberezhskaya, E. N. Pron'kova, and O. I. Iushkova (Akademiia Meditsinskikh Nauk SSSR, I. Moskovskii Meditsinskii Institut, Moscow, USSR) *Gigiena Truda i Professional'nye Zabolovaniia*, May 1982, p. 11-15. 8 refs. In Russian

Attention is given to the fatigue and overexertion that manifest themselves in physical work performed by, say, only the hands. The movements are of a prescribed type, and they do not require that the entire body be in motion. Fatigue of the neuromuscular apparatus, which is related to the workload, is found to be the principal cause of muscular strain. For work involving only hand motion, a link is found between the number of movements required by a particular type of work and the incidence of such maladies as myalgia and myofascitis. C R

**A82-38573 † Achievements and possibilities in the research being carried out to protect workers in the 11th five-year plan from noise and vibration (Itogi i perspektivy issledovaniia po profilaktike vlianiia shuma i vibratsii na rabotaiushchikh v odinnadtsatoi piatiletke).** G. A. Suvorov (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Gigiena Truda i Professional'nye Zabolovaniia*, May 1982, p. 1-4. 6 refs. In Russian

**A82-38577 † Histochemical changes in experimental animals exposed to variable noise (Gistokhimicheskie izmeneniia u eksperimental'nykh zhivotnykh pri vozdeistvii nepostoianno shuma).** O. K. Khmel'nitskii, Z. G. Grigor'eva, and K. V. Negrienko (Leningradskii Institut Usovershenstvovaniia Vrachei, Leningrad, USSR) *Gigiena i Sanitariia*, Apr. 1982, p. 92, 93. 7 refs. In Russian

Histochemical changes produced in various organs of rats exposed to 5 hours daily of transportation noise at an equivalent level of 65 dB over the course of 60 days are investigated. Measurements of the concentrations of glucose-6-phosphate dehydrogenase, peroxidase, succinate dehydrogenase and lactate dehydrogenase in the follicular epithelium of the thyroid gland reveal a significant enhancement in synthetic activity and hormone production at the expense of glycolysis, the pentose cycle and the Krebs cycle following noise exposure. Cells of the zona fasciculata of the adrenal cortex showed moderate changes indicative of a reduction of energy-producing processes, while myocardial cells showed evidence of an uncharacteristic activation of the pentose cycle. A L W

**A82-38578 † Setting hygienic standards to be applied to environmental standards pertaining to the rolling stock of railroads and subway systems (Voprosy igienicheskogo normirovaniia faktorov sredy podvzhnogo sostava zheleznykh dorog i metropolitenov).** A. A. Prokhorov and S. V. Suvorov (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Zheleznodorozhnoi Gi-

gieny, Moscow, USSR) *Gigiena i Sanitariia*, Apr. 1982, p. 79, 80. 16 refs. In Russian

**A82-38579 † A method of evaluating the functional state of the central nervous system of a person performing work (K metodike otsenki funktsional'nogo sostoiianiia tsentral'noi nervnoi sistemy cheloveka v protsesse truda).** I. I. Ponomarenko and G. A. Antropov (Moskovskii Nauchno-Issledovatel'skii Institut Gigieny, Moscow, USSR) *Gigiena i Sanitariia*, Apr. 1982, p. 59-61. In Russian

A method is described that makes possible a determination of quantitative and qualitative indicators of the following: the interactions of the first and second signal systems, criteria for stress on the nervous system, and the ratios between the principal nervous processes. The state of the central nervous system is evaluated by measuring the latent reaction time to light and then determining the ratio between excitation and inhibitory processes. The latent reaction time here is measured in three series in which the light stimulus acts for 3-5 sec. C R

**A82-38580 † Setting safety standards for ionizing radiation (Ob osnovernaniakh igienicheskogo normirovaniia ioniziruiushchego izlucheniia).** I. V. Filushkin and I. M. Petoian (Ministerstvo Zdravookhraneniia SSSR, Moscow, USSR) *Gigiena i Sanitariia*, Apr. 1982, p. 48-51. 16 refs. In Russian

It is pointed out that safety standards today are based on a linear concept that does not recognize a threshold. An alternative approach, one based on a recognized threshold of carcinogenic effects, is described. In deciding between these two approaches, it is necessary to know whether a threshold is an actual biological phenomenon. The way in which the zero hypothesis can be used to justify both approaches is demonstrated. C R

**A82-38581 † Effect of the combined administration of antibiotic-resistant bifidobacteria and the corresponding antibiotics on the survival of irradiated mice (Vlianie sochetannogo primeneniia antibiotikoustoi-chivnykh bifidobakterii i sootvetstvuiushchikh antibiotikov na vyzhivaemost' obлучennykh myshei).** V. M. Korshunov, B. V. Pinegin, N. P. Ivanova, and V. N. Mal'tsev (II Moskovskii Gosudarstvennyi Meditsinskii Institut, Ministerstvo Zdravookhraneniia SSSR, Institut Biofiziki, Moscow, USSR) *Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii*, May 1982, p. 50-53. 13 refs. In Russian

**A82-38582 † Delayed effects of the internal irradiation of endocrine system in female rats (Otdalennye posledstviia vnutrennego obлучeniia endokrinnoi sistemy samok krysa).** V. I. Dedov (Tsentral'nyi Institut Usovershenstvovaniia Vrachei, Moscow, USSR) *Akademiia Nauk SSSR, Izvestiia, Seria Biologicheskaya*, May-June 1982, p. 454-458. 8 refs. In Russian

Experimental data are presented on the condition of rat endocrine system several months after a single injection of selenium-75-selenium methionine. The development of harmful side effects such as tumors of the mammary gland, uterus, and endocrine organs is shown to result from persistent disturbance of the hormonal homeostasis induced by the internal radiation. The principal pathogenic factors in the development of the tumors are high blood levels of estrogen and prolactin combined with thyroxine deficiency. V L

**A82-38583 † The effect of serotonin on the development of acute hyperthermia in rats (Vlianie serotoninina na razvitiie ostroi gipertermii u krysa).** A. V. Konusova (Novosibirskii Gosudarstvennyi Universitet, Novosibirsk, USSR) *Akademiia Nauk SSSR, Sibirskoe Otdeleniie, Izvestiia, Seria Biologicheskikh Nauk*, Apr. 1982, p. 110-112. 7 refs. In Russian

Injections of serotonin creatine sulfate were administered to rats following heating with a 250-W infrared lamp from a distance of 65 cm. The prior heating is found to accelerate the serotonin-induced overheating of the rat body to 42°C after the injection, however, the skin temperature of rats injected with serotonin is lower than that of rats in the control group. The effect of serotonin is found to be dose dependent and is attributed to heat transfer inhibition. V L

**A82-38584 † Serotonin content of peripheral organs and tissues in rats under normal conditions and under stress during postnatal development (Soderzhanie serotoninina v perifericheskikh organakh i tkaniakh v norme i pri deistvii stressa v protsesse razvitiia krysa).** I. I. Lobacheva (Akademiia Nauk SSSR, Institut Tsitologii i Genetiki, Novosibirsk, USSR) *Akademiia Nauk SSSR, Sibirskoe Otdeleniie, Izvestiia, Seria Biologicheskikh Nauk*, Apr. 1982, p. 112-116. 20 refs. In Russian

The serotonin levels of stomach, spleen, blood, and brain were determined in 4- and 16-day-old rats as well as in adult rats 70-80 days old. The serotonin levels are found to increase much more rapidly in peripheral tissues than in the brain. In response to immobilization, blood serotonin of adult rats increases, while serotonin level in stomach decreases. Stress-induced changes in the serotonin content of peripheral tissues are not evident immediately after birth, but appear at a certain point during postnatal development. Thus, such changes were not observed in 4-day-old rats but were marked in 16-day-old animals. V L

**A82-38585 † The effect of laser radiation on lipid synthesis in yeast (Deistvie lazernogo izlucheniia na sintez lipidov v drozhdzhakh).** L. P. Koval'-



chuk, S A Burtseva, and P N Razumovskii (Akademiia Nauk Moldavskoi SSR, Otdel Mikrobiologii, Kishinev, Moldavian SSR) *Biophysika*, vol 27, May-June 1982, p 554, 555 In Russian

**A82-38586** † **Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions (Neteplovoye vozdeistvie SVCh impul'sov nanosekundnoi dlitel'nosti na transepitelial'nyi perenos ionov natriia).** N D Deviatkov, Z S Chernov, O V Betski, T A Novskova, and A V Putvinskii (Akademiia Nauk SSSR, Institut Radiotekhniki i Elektroniki, Moscow, USSR) *Biophysika*, vol 27, May-June 1982, p 552-555 5 refs In Russian

Nonthermal biological effects of electromagnetic waves are investigated using a newly developed relativistic microwave generator based on an explosive-emission electron accelerator. The exposure of isolated frog skin to 10-ns microwave pulses of a peak power of 30 MW, at a wavelength of 3 cm, is shown to result in a marked acceleration of Na(+) transport during several minutes following irradiation V L

**A82-38587** † **The mechanism of the microwave effect on the conductivity of bilayer lipid membranes (K mekhanizmu mikrovolnogo deistviia na provodimost' bisloinykh lipidnykh membran).** S I Alekseev, V V Chertishchev, Iu A Kim (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Biophysika*, vol 27, May-June 1982, p 545, 546 7 refs In Russian

The conductivity of bilayer lipid membranes modified with amphotericin B, gramicidin C, and tetraphenylborate has been studied as a function of specific absorbed power during microwave irradiation. The relationship between conductivity change and specific absorbed power is found to be linear. Experimental data are shown to be consistent with the hypothesis that a microwave field affects bilayer lipid membranes through local heating V L

**A82-38588** † **Ion currents through a neuron membrane during the injection of cyclic nucleotides (Ionnye toki cherez membranu neirona pri in'ektsii tsiklicheskikh nukleotidov).** E A Liberman, S V Minina, and N E Shklovskii-Kordi (Akademiia Nauk SSSR, Institut Problem Peredachi Informatsii, Moscow, USSR) *Biophysika*, vol 27, May-June 1982, p 542-545 13 refs In Russian

**A82-38589** † **The flavin-dependent consumption of oxygen in mitochondria under illumination (Flavin-zavisimoe potreblenie kisloroda v mitokondriakh pri osveshchenii).** N L Vekshin and G P Mironov (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Biophysika*, vol 27, May-June 1982, p 537-539 7 refs In Russian

The use (absorption) of light by oxygen in an illuminated suspension of mitochondria from rat liver is described. A 5% solution of copper sulfate is used as the heat filter. The consumption of oxygen ceases when the light is turned off. Alpha-ketoglutarate accelerates the consumption, but glutamate, beta-oxybutyrate, and succinate are found to have no effect. Since rotenone and antimycin retard the process only slightly, it is thought that the consumption cannot derive from the respiratory chain. Sodium azide, however, slows the process by half. The absorption of light by oxygen is therefore seen as a consequence of photochemical involving a substrate, triplet flavins, and oxygen. It is thought likely that these reactions are for the photochemical oxidation of phospholipids and substrates of the alpha-ketoglutarate type and that they involve triplet flavins and singlet oxygen C R

**A82-38590** † **A comparison between the protonophoric and separating functions of weak dibasic acids (Srvnenie protonofornoi i razobshchaisushchei funktsii slabnykh dvukhosnovnykh kislot).** E E Topaly, V P Topaly, A F Kozhokaru, and A D Rakul (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Moscow, USSR) *Biophysika*, vol 27, May-June 1982, p 535-537 6 refs In Russian

The effect of five dibasic acids on the speed of mitochondrial respiration and on the electrical conductivity of bilayer lipid membranes is investigated. A correlation is found between the physiological and protonophoric functions of the acids. The results are seen as supporting a chemosmotic mechanism for oxidative phosphorylation C R

**A82-38591** † **The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase (Ob otsutstvii vlianiia magnitnogo polia na Na<sup>+</sup>/K<sup>+</sup>-zavisimuiu ATFazu).** M L Savich, M V Shcheglova, L M Raikhan, and A N Kuznetsov (Nauchno-Issledovatel'skii Institut po Biologicheskim Ispytaniiam Khimicheskikh Soedinenii, Kupavna, USSR) *Biophysika*, vol 27, May-June 1982, p 532, 533 8 refs In Russian

**A82-38592** † **Attributing macroscopic fluctuations in aqueous solutions of proteins and other substances to the class of flicker noise (Ob otnesenii makroskopicheskikh fluktuatsii v vodnykh rastvorakh belkov i drugikh veshchestv k klassu flicker-shumov).** N V Udal'tsova (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Biophysika*, vol 27, May-June 1982, p 529-531 11 refs In Russian

A frequency analysis of macroscopic fluctuations is carried out. The spectral density, which shows how the variability of a process is distributed on the basis of frequency, is chosen as the frequency characteristic. Evaluations of the spectral density are averaged. The dependence of the density on frequency  $f$  is found to have the shape of a hyperbola, which is seen as justifying the classification of these macroscopic fluctuations as  $1/f$  processes C R

**A82-38593** † **Determination of blood-lipoprotein dimensions by optical methods (Opredelenie razmerov lipoproteidov krovi opticheskimi metodami).** S M Burkitbaev, G E Dobretsov, and E A Manykin (Moskovskii Inzhenerno-Fizicheskii Institut, II Moskovskii Gosudarstvennyi Meditsinskii Institut, Moscow, USSR) *Biophysika*, vol 27, May-June 1982, p 528, 529 8 refs In Russian

**A82-38594** † **Specificity of action of monovalent cations on the ATPase activity of myosin HMM-S-1 (Spetsifichnost' deistviia odnovalentnykh kationov na ATFazu subfragmenta HMM-S-1 miozina).** Z I Vishnevskaya (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Biophysika*, vol 27, May-June 1982, p 527, 528 In Russian

**A82-38595** † **Changes in man's constant electric field in the course of adaptation to hypokinesia (Izmenenie postoiannogo elektricheskogo polia cheloveka v protsesse adaptatsii k usloviu gipokinezii).** G N Zatsapina, S P Kuprin, S V Tul'skii, and M N Flerov (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Biophysika*, vol 27, May-June 1982, p 520-526 10 refs In Russian

It is shown that the process of adaptation to hypokinesia after normal physical stress, and vice versa, is characterized by equal values of the electric potential difference between certain fixed points of the skin. Once the state of adaptation is reached, superposition of adaptation processes does not change the mean value of the electric potential difference. The level of adaptation is the upper amplitude value of the electric potential difference for a healthy individual V L

**A82-38597** † **A study of the mechanism governing the different types of behavior exhibited by the spiral excitation wave period in auricle and ventricle (Issledovanie mekhanizma razlichnogo povedeniia perioda spiral'nykh voln vozbuzhdeniia v predserdii i zheludochke).** A K Grenader and G G Zurabishvili (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Biophysika*, vol 27, May-June 1982, p 505-508 9 refs In Russian

Sources of spiral excitation waves (reverberators) were generated in strips of rabbit atrial and ventricular tissues by feeding a single, properly timed electric stimulus. It is found that the source period increases during the first seconds following its appearance in atrial tissue, while showing little change in ventricular tissue. The relationship between changes in the source period and the refractoriness of heart tissue is investigated, and a model is proposed which accounts for the observed differences in the behavior of the source period in auricle and ventricle V L

**A82-38598** † **Changes in the microelement content of muscles under denervation (Izmenenie soderzhanii mikroelementov v myshtsakh pri denervatsii).** M M Ogievetskaia (Akademiia Nauk SSSR, Institut Khimicheskoi Fiziki, Moscow, USSR) and E L Zhuravleva (Ob'edinennyi Institut Iadernykh Issledovani, Dubna, USSR) *Biophysika*, vol 27, May-June 1982, p 501-504 10 refs In Russian

X-ray fluorescence spectrometry has been used to determine the contents of Zn, Br, and Rb in the rat musculus gastrocnemius following denervation. It is found that by the third week after denervation, the concentration of microelements increases in the denervated muscle and decreases in the intact muscle. Analysis of microelement content in the intact muscle has made it possible to identify two stages in post-denervation changes: hypertrophy and atrophy. The differences in the dynamics of concentration changes in denervated and intact cells suggest that the rate of protein decomposition and microelement utilization in denervated muscle cells are essentially different V L

**A82-38599** † **Proof of the existence of Ca<sup>2+</sup>-induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles (Dokazatel'stvo sushchestvovaniia Ca<sup>2+</sup>-indutsiruemogo strukturnogo perekhoda v stvolakh miozinsoderzhashchikh nitei skeletnykh myshts pozvonochnykh).** V V Lednev, L K Srebnitskaia, A N Kornev, and S B Malinichik (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Biophysika*, vol 27, May-June 1982, p 493-497 7 refs In Russian

**A82-38600** † **Temperature characteristics of the ouabain-insensitive sodium flux in frog muscles (Temperaturnaia kharakteristika ouabain-nechuvstvitelnogo potoka natriia v myshtse liagushki).** T G Ambartsumian, G G Marikyan, and S Ia Adamian (Akademiia Nauk Armianskoi SSR, Fizicheskii Institut, Yerevan, Armenian SSR) *Biophysika*, vol 27, May-June 1982, p 489-492 11 refs In Russian

**A82-38601** † Conditions leading to kinetic and thermodynamic isotopic effects in a cell (Ob usloviakh poivleniia kineticheskikh i termodinamicheskikh izotopnykh effektiv v kletke). A A Ivlev, D A Kniazev, and A G Kaloshin (Vsesoiuznaia Akademiia Sel'skokhoziaistvennykh Nauk, Moscow, USSR) *Biofizika*, vol 27, May-June 1982, p 485-488 15 refs In Russian

A study was made of the conditions associated with thermodynamic and kinetic isotopic effects of carbon in metabolic processes. The key role of kinetic isotopic effects that occur at metabolic path bifurcations is demonstrated. It is shown that a kinetic isotopic effect involved in the reaction of pyruvate decarboxylation is the principal element of the mechanism of isotopic carbon fractionation in cells

V L

**A82-38602** † A possible explanation for the fluctuations in reflectivity exhibited by bilayer lipid membranes excited during electrostriction (Vozmozhnaia priroda kolebanií otrazhatel'noi sposobnosti bisloinnykh lipidnykh membran, vzbuzhdaemykh pri elektrostriksii). V I Pasechnik (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Biofizika*, vol 27, May-June 1982, p 469-474 16 refs In Russian

**A82-38603** † A measurement of the size distribution of lipoproteins in the plasma of human blood (Izmerenie raspredeleniia po razmeram lipoproteidov plazmy krovi cheloveka). A N Klimov, G E Shmelev, V A Noskin, I F Mamontova, L G Petrova-Maslakova, and N S Parfenova (Akademiia Nauk SSSR, Leningradskii Institut Iadernoi Fiziki, Leningrad, USSR, Akademiia Meditsinskikh Nauk SSSR, Leningrad, USSR) *Biofizika*, vol 27, May-June 1982, p 458-462 7 refs In Russian

It is shown that the optical displacement method can be used to investigate the size distribution of lipoprotein particles. The sensitivity of the method to changes in the distribution during the incubation of lipoprotein particles is assessed under various conditions. In particular, it is shown that in incubating lipoproteins of low density together with erythrocytes, donor properties of the lipoproteins relative to cholesterol manifest themselves, in the incubation of high-density lipoproteins with these cells, the result is more complex. Here, the lipoproteins separated from the hypercholesteremic plasma exhibit donor properties, whereas those obtained from the plasma having a normal level of cholesterol exhibit acceptor properties

C R

**A82-38604** † The conductivity of model protein-lipid membranes (Provodimost' model'nykh belkovo-lipidnykh membran). S A Badzhnian and K G Manukian (Akademiia Nauk Armianskoi SSR, Institut Biokhimi, Yerevan, Armenian SSR) *Biofizika*, vol 27, May-June 1982, p 450-453 11 refs In Russian

Artificial membranes are reconstructed using proteolipids from the white substance of cattle brains. The proteolipids differ in the extent to which they have been purified and in the content (72, 50-45, 15-8 wt %) and qualitative composition of the lipids connected to them. The conductivity of artificial membranes of all three types of proteolipids in 0.1-M solutions of alkali metal chlorides is found to be higher by two to three orders of magnitude than that of bilayer membranes composed of lecithin and the common phospholipids of the brain. In all cases, membranes composed of proteolipids that are 85-92% protein have the highest conductivity, and those of proteolipids that are 28% protein have the lowest

C R

**A82-38605** † Gramicidin A-induced conductance of the muscle fiber membrane (Indutsirovannaiia gramitsidinom A provodimost' membrany myshechnogo volokna). N E Shvinka, G Kafier, and V V Malev (Akademiia Nauk SSSR, Institut Tsitologii, Leningrad, USSR, Tsentral'nyi Institut Fizologii i Meditsiny Truda, Berlin, East Germany) *Biofizika*, vol 27, May-June 1982, p 445-449 13 refs In Russian

The conductance of an isolated muscle fiber induced by gramicidin A has been investigated by the method of double saccharose bridge under constant current conditions. It is shown that the conductance is directly proportional to gramicidin concentration in the solution. The results suggest that the gramicidin channel in the muscle membrane is of dimer nature

V L

**A82-38606** † The incorporation of an erythrocyte membrane into planar bilayer lipid membranes (Vkluchenie membrany eritrotsitov v ploskie bisloinnye lipidnye membrany). I N Babunashvili and V A Nenashev (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Biofizika*, vol 27, May-June 1982, p 441-444 8 refs In Russian

The volt-ampere characteristics of planar bilayer lipid membranes modified by vesicles from the erythrocyte membranes of rabbits are investigated. The vesicles contain amphotericin B and tetraethylammonium. It is shown that for several minutes after the vesicle makes contact with the membrane there is partial fusion and that while this is occurring a bilayer is formed consisting of a layer of erythrocyte membrane lipids and a planar membrane layer. Approximately 30 minutes later, the erythrocyte membranes are observed to enter the planar membrane, this occurs either through fusion or through the embedment of the sealed vesicle. Higher temperatures are found to increase the probability of fusion. The sealed vesicles are embedded in the membrane asymmetrically, the area of contact is always smaller than the area without contact

C R

**A82-38607** † An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane (Issledovanie konformatsionnoi ustoiichivosti immunoglobulinov G v monosloiaakh na granitse faz vodnye rastvory NaCl-oktan). L V Chasovnikova, N A Matveeva, and V V Lavrent'ev (II Moskovskii Gosudarstvennyi Meditsinskii Institut, Moscow, USSR) *Biofizika*, vol 27, May-June 1982, p 435-440 17 refs In Russian

**A82-38608** † Light curves for photosynthesis under intermittent illumination (Svetovye krivye fotosinteza pri impul'snom osveshchenii). V I Zvalinskii (Akademiia Nauk SSSR, Institut Biologii Moria, Vladivostok, USSR) and F F Litvin (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Biofizika*, vol 27, May-June 1982, p 410-414 8 refs In Russian

A mathematical description is proposed for the light curve typical of intermittent-illumination photosynthesis for unicentral and multicentral organizations of photosynthetic units. It is shown that the curve shape is determined by the number of photosynthetic units per domain (degree of multicentrality) and the efficiency of energy migration between the units. A criterion is proposed for distinguishing between unicentral and multicentral photosynthetic unit organizations

V L

**A82-38609** † Thermodynamic parameters characterizing interaction between polymer-absorbed ligand molecules (Termodinamicheskie parametry, kharakterizivshchie vzaimodeistvie mezhdu molekulami liganda, adsorbirovannymi na polimere). Iu D Nechipurenko (Akademiia Nauk SSSR, Institut Molekularnoi Biologii, Moscow, USSR) *Biofizika*, vol 27, May-June 1982, p 391-398 11 refs In Russian

**A82-38610** † Conformational dynamics of proteins and simplest molecular 'machines' (Konformatsionnaia dinamika belkov i prostelshie molekuliarnye mashiny). K V Shaitan and A B Rubin (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Biofizika*, vol 27, May-June 1982, p 386-390 13 refs In Russian

The stochastic nature of macromolecular dynamics and the coupling between the functional activity and conformational mobility of proteins are discussed with reference to experimental data obtained by Mossbauer spectroscopy. It is shown that the conformational motion of macromolecule fragments is realized by a diffusion mechanism through conformational substrates. An equation describing the operation of a simple molecular 'machine' is obtained and its solution is presented

V L

**A82-38611** † The temperature dependence of the H-1 NMR spectrum of hydrated collagen (Temperaturnaia zavisimost' spektra iaMr 1H gidratirovannogo kollagena). Iu P Meshalkin, S P Gabuda, and A F Rzhavin (Novosibirskii Gosudarstvennyi Meditsinskii Institut, Akademiia Nauk SSSR, Institut Neorganicheskoi Khimii, Novosibirsk, USSR) *Biofizika*, vol 27, May-June 1982, p 375-379 7 refs In Russian

By analyzing the temperature dependence of the spin-spin interaction constant, it is shown that the population probabilities for the donor and acceptor adsorption centers on the collagen surface are 1/10 or less and zero, respectively, at temperatures below 265 K. At 265-283 K, the population probabilities are 1/30 or less for the donor centers and zero for the acceptor centers. Above 283 K, the fine structure of the H-1 NMR spectra disappears due to destruction of the clathrate-like structures of the protein hydrate shell

V L

**A82-38612** † The effect of urea and heat on the activity of lactate dehydrogenase and glucose 6-phosphate dehydrogenase (Vlianie mocheviny i tepla na aktivnost' laktatdehidrogenazy i glukoz-6-fosfatdehidrogenazy). V I Stabrovskaiia and A D Braun (Akademiia Nauk SSSR, Institut Tsitologii, Leningrad, USSR) *Biofizika*, vol 27, May-June 1982, p 371-374 6 refs In Russian

The stability of lactate dehydrogenase and glucose 6-phosphate dehydrogenase under exposure to urea and heat was investigated within the muscle system and in an isolated state. Both enzymes were found to have higher heat stability than creatine kinase, glucose 6-phosphate dehydrogenase being the more stable enzyme. In the case of muscle exposure to urea, glucose 6-phosphate dehydrogenase had the highest stability and lactate dehydrogenase had the lowest stability among the enzymes studied. However, when the effect of urea was investigated on isolated enzymes, glucose 6-phosphate dehydrogenase proved to be the most labile of the enzymes studied

V L

**A82-38613** † Acridine orange inhibition of the ATPase activity of myosin and its fragments (Ingibirovanie ATPaznoi aktivnosti miozina i ego fragmentov akridinovym oranzhevym). L G Filatova, I G Shtrankfel'd, D I Levitskii, and N G Esipova (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR, Akademiia Nauk SSSR, Institut Molekularnoi Biologii, Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Biofizika*, vol 27, May-June 1982, p 368-370 8 refs In Russian

**A82-38614** † Reactions of O-18 exchange in the myosin systems of skeletal, cardiac, and smooth muscles (O-18-obmennye reaktsii v sisteme

**miozina skeletnykh, serdechnoi i gladkikh myshts).** N S Panteleeva, E A Karandashov, G G Ivanov, I E Krasovskaia, N V Kuleva, V M Danilova, and M A Zueva (Leningradskii Gosudarstvennyi Universitet, Leningrad, USSR, Vsesoiuznyi Kardiologicheskii Nauchnyi Tsentr, Moscow, USSR, Kievskii Gosudarstvennyi Universitet, Kiev, Ukrainian SSR) *Biofizika*, vol 27, May-June 1982, p 365-367 14 refs In Russian

**A82-38615 1 The effect of monovalent cations on the ATPase activity and superprecipitation of actomyosin (Vlianie odnovalentnykh kationov na ATFaznuiu aktivnost' i superpretsipitatsiiu aktomiozina).** G I Pavliashvili, M Sh Simonidze, R M Kupatadze, and M M Zaalishvili (Akademia Nauk Gruzinskoi SSR, Institut Fiziologii, Tbilisi, Georgian SSR) *Biofizika*, vol 27, May-June 1982, p 362-364 7 refs In Russian

**A82-38694 F-actin is a helix with a random variable twist.** E H Egelman, N Francis, and D J DeRosier (Brandeis University, Waltham, MA) *Nature*, vol 298, July 8, 1982, p 131-135 21 refs Grant No NIH-GM-21189

Electron microscopic observations and modeling of disorder in the structure of the F-actin filaments are reported. Digitized electron micrographs of negatively stained filaments were analyzed by Fourier transformations, layer line spacings were measured, and the number of units per turn were quantified. The actin filaments were found to untwist 0.5 deg per subunit. A variable twist model is constructed considering a constant axial rise of 27.3 Å and a sequence of random angular deviations. An angular disorder of 10 deg was chosen and model predictions regarding the variability between cross-over points within a filament and the effects of the transform of the filaments by the presence of a variable twist were made. It is concluded that actin filaments within cross-bridged bundles are not helical and are governed by interfibrillar interaction. M S K

**A82-38698 Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of *Neurospora crassa*.** P van den Boogaart, J Samallo, and E Agsterbeek (Groningen Rijksuniversiteit, Groningen, Netherlands) *Nature*, vol 298, July 8, 1982, p 187-189 17 refs Research supported by the Nederlandse Organisatie voor Zuiver-Wetenschappelijk

The location and possible function of a nucleotide sequence on the mitochondrial DNA of *N. crassa* which encodes a dicyclohexylcarbodiimide (DCCD) protein are discussed along with its evolutionary origin. Evidence for the genetic character of the 225 nucleotide sequence includes a conservation of glycine in three positions, arginine at one, proline at one, and alanine at one, the conservation of the DCCD-binding glutamic acid at another, the absence of histidine and tryptophan, and the distribution of hydrophobic and hydrophilic amino acid residues along the polypeptide chain. Noting that the gene segment lacks a small mRNA transcript, the possibility that the gene has recently become nonfunctional is discussed. The continued presence of the gene is taken as evidence that the gene is active, has existed in *Neurospora* for a long time, and may have resulted from the uptake of a foreign gene. M S K

**A82-38795 Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating.** H M Petry, W J Donovan, R K Moore, W B Dixon, and L A Riggs (Brown University, Providence, RI) *Vision Research*, vol 22, no 7, 1982, p 745-755 38 refs Grant No NIH-EY-0744

**A82-38796 Contrast influence on perceived orientation.** A Cattaneo (CNR, Istituto di Neurofisiologia, Pisa, Italy) and D Spinelli (Padova, Università, Padova, Italy) *Vision Research*, vol 22, no 7, 1982, p 783-785 7 refs

When two gratings of slightly different orientation and equal contrast are presented dichoptically the observer perceives a unique fused grating at an orientation intermediate between the two. It is shown that if the contrast of the two gratings is different the perceived orientation of the fused grating depends on the relative contrast of the two monocular images. The results show that the perceived orientation varies linearly with the contrast difference, provided that the contrast values of the gratings presented to each eye are such as to give rise to a fused image. In these conditions, the perceived orientation is the average of the two monocular orientations, weighted with their contrast. (Author)

**A82-38797 Effects of reference lines on displacement thresholds at various durations of movement.** C A Johnson and R P Scobey (California, University, Davis, CA) *Vision Research*, vol 22, no 7, 1982, p 819-821 14 refs Grants No NIH-R01-EY-03424, No NIH-R01-EY-01495

Subjects were exposed to a moving line and a reference line, both in vertical orientation, in order to determine the threshold for detection of movement. The lines were projected on a CRT, with the mobile line being moved according to a ramp function, with the slope of the ramp determined by the displacement and duration of the stimulus. Movements lasted from 10-2500 msec, and trials were run with and without reference lines. The presence of the reference line was found to reduce the movement displacement detection threshold at all time intervals examined. The thresholds were not linked to a constant velocity process. Finally, the use of reference stimuli was determined to result in acuity of 12-15 arcsec among the subjects. M S K

**A82-38798 Color vision in the peripheral retina under photopic conditions.** U Stabell and B Stabell (Oslo, Universitetet, Oslo, Norway) *Vision Research*, vol 22, no 7, 1982, p 839-844 22 refs

**A82-38799 Hyperacuity for luminance phase angle in the human visual system.** M J Morgan and R J Watt (University College, London, England) *Vision Research*, vol 22, no 7, 1982, p 863-866 12 refs Medical Research Council Grant No G979/870/N

A moving target with identical trajectories in the two eyes appeared shifted in depth if flickered with a phase difference between the eyes. The direction of the depth shift was the same as if the phase-lagging eye had been seeing the target with a spatial advance in the direction of target motion. Maximum acuity for this effect was in the region of 7 deg of phase angle, which may be expressed as a spatial difference between corresponding luminance points of about 13 sec arc. Acuity was approximately constant over a wide range of modulation periods from 50 to 150 msec when expressed in terms of phase angle, but fell off rapidly at higher and at lower frequencies. The results cannot be explained simply by either conventional disparity theory or by spatio-temporal interpolation, but suggest that inter-ocular correspondence is influenced by dynamic luminance information. (Author)

**A82-38802 Absorption characteristics of prolate spheroidal models exposed to the near fields of electrically small apertures.** A Lakhtakia, M F Iskander, C H Durney, and H Massoudi (Utah, University, Salt Lake City, UT) *IEEE Transactions on Biomedical Engineering*, vol BME-29, Aug 1982, p 569-576 20 refs

Irradiation of prolate spheroidal models of biological models by the near fields of electrically small apertures is analyzed. The solution procedure involves the replacement of the aperture source by an equivalent configuration of electric and magnetic dipoles. The specific absorption rate induced in the irradiated object is then calculated using the extended boundary condition method. Numerical results are presented for the exposure case where the incident electric field at the spheroid location is parallel to the major axis of the model. This polarization is associated with the maximum low-frequency absorption in biological models and, hence, is the most important polarization case in microwave dosimetry. (Author)

**A82-38823 # On the mathematical modelling of microbial age dynamic and some control aspects of microbial growth processes.** J Ranta (Technical Research Centre of Finland, Electrical Engineering Laboratory, Esbo, Finland) *Acta Polytechnica Scandinavica, Mathematics and Computer Science Series*, no 35, 1982 107 p 164 refs Research supported by the Academy of Finland, Alfred Kordelin Foundation, Emil Aaltonen Foundation, and Finnish Cultural Foundation

The biomass age dynamic is studied, and it is shown that the model of the age distribution dynamic can be converted into a feedback system described by a Volterra type integral equation. The latter's asymptotic properties show that the age distribution can be stabilized only by using a dilution rate with the constant specific growth rate, which is proposed. The maximum sustainable yield is found and it is shown that there is only one age distribution for which the process can be stabilized, this being the eigenvector associated with the maximum eigenvalue of the Leslie matrix. The discrete model can be presented as a bilinear system with stability properties. Dynamic equations for the average age of biomass and the variance of the average age can be produced, and the average age and age distribution can describe changes in the intercellular states of the biomass. Mathematically analogous statements can be formulated for other measures such as the DNA or protein content. C D

**A82-38841 The nature and rate of occurrence of medical emergencies on board Air France aircraft (Nature et fréquence des urgences médicales à bord des avions d'Air France).** J Pasquet, J Lavernhe, and E Dozolme (Compagnie Nationale Air France, Service Médical, Paris, France) *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 14-17 In French

Illnesses and injuries requiring medical attention on board Air France aircraft during the years 1978-79 are discussed. A total of 585 events requiring medical attention and 379 uses of the emergency medical kit occurred, with seven instances leading to the necessity of requesting radio-relayed instructions from the ground. A plurality of all incidents comprised benign neurological or neurotic disorders such as excitement or anxiety, while 30.74 percent of the total cases were actual injuries such as foreign bodies in the mouth or eye. Twelve cases needing surgical intervention were encountered, including appendicitis, pancreatitis, and bleeding ulcers. The equipment, procedures, and the presence of a radio are concluded to have proved efficacious in handling the medical events which have happened on the flights. M S K

**A82-38842 Physiological stresses linked to flight on airliners (Contraintes physiologiques liées au vol sur les avions de ligne).** J Colin (Service de Santé des Armées, Paris, France) *Médecine Aéronautique et Spatiale*, vol

21, 1st Quarter, 1982, p 18-22 In French

Pathological physiological conditions linked to flight on board aircraft are caused either by characteristics of the cabin atmosphere, to motions of the aircraft, or to normal functions of the aircraft, such as radio communications, vibrations, etc. Atmospheric problems which occur include hypoxia if pressurization is lost above 5000 m and barotraumas such as diaphragmatic spasms due to exposure to the ambient pressures at 1800 m altitude. Decompression is most dangerous to persons who have been deep-sea diving very soon prior to flight. Some protection from high altitude ionizing and nonionizing radiation is lost during flights, although the duration of flights is nominally short enough to ensure no excessive radiation is absorbed by passengers. Air sickness is largely eliminated by high altitude cruising to avoid turbulence. Finally, sound levels encountered in modern airliners are kept below the 80 dB levels which serve as a standard above which physical damage can occur. M S K

**A82-38843 Medical emergencies in flight - Pathogenic aspects (Urgences médicales en vol aspects pathogéniques).** G Leguay (Hôpital Dominique Larrey, Versailles, France) *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 22-26 In French

Medical emergencies which occur during flight happen with a frequency of 1/17,271 passengers, are chiefly of a benign neurological nature, and in serious cases mainly comprise coronary angina, epileptic crises, nephritic colic, or acute abdominal pain. Causes of myocardial anoxia, which is indicated by the presence of angina, are explored, including those due to the cabin conditions and the emotional stress experienced by the passenger. Although high altitude flight does offer precipitating circumstances which can lead to anginal pain, only 29 cases have been observed thus far with 20,900,000 passengers. Little evidence exists for a significant role of flight in lithogenesis or renal colic, while cases of epileptic fits have been observed at a rate of 37/20,897,000 passengers. Contributing factors which can be linked to flight are a lack of sleep, hyperventilation, and intermittent lighting levels which precipitate photogenic attacks. It is concluded that most events occurring in flight are due to a disruption of normal living patterns, a change of surroundings, fear of flying, or an alteration in medication schedules. M S K

**A82-38844 Medical emergencies on board an airliner - Procedures when a doctor is on board (Urgences médicales à bord des avions de ligne - Conduite à tenir en vol en présence d'un médecin).** P Fourn (Union de Transports Aériens, Paris, France) *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 26-30 In French

**A82-38845 Medical emergencies on board airliners - Procedures in the absence of a doctor (Les urgences médicales à bord des avions de ligne - Conduite à tenir en l'absence de médecin à bord).** P Ledoux (Lignes Aériennes Intérieures Air Inter, Paray-Vieille-Poste, Essonne, France) *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 30-32 In French

Procedures which a flight attendant will follow in the event of a medical emergency on board an airliner in flight when a doctor has not been found among the passengers are reviewed. An inventory is made of available medical supplies after first aid has been given to the stricken passenger. Medications are administered from the emergency medical kit where deemed necessary while other utensils are improvised from material at hand. Advice is gained by radio communications with the ground and emergency evacuation of seriously ill persons is arranged to take place immediately upon landing. Attention is given to the process of examining the passenger, including skin color, location of pain, state of consciousness, pulse, breathing, and an assessment of the threat to the person's life due to heart malfunction. A suitable posture must be found for the passenger and oxygen from the emergency breathing apparatus must be ready. M S K

**A82-38846 Medical emergencies on board airliners - Ground management (Urgences médicales à bord des avions de ligne - Conduite à tenir ausol).** A van Elstraete and M Cara (Hôpital Necker, Paris, France) *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 33-36 In French

Ground-based assistance to medical emergencies on board an airliner in-flight include the provision of medical information, the power to deny or comply with a request for rerouting for an emergency landing, and to prepare assistance for a stricken person whose plane lands. French airports have on hand necessary medical equipment, personnel, access to other branches of an international aeromedical network, and the authority to accept a patient from a foreign aircraft which has been diverted to an emergency medical landing. A 24-hr radio monitoring service for medical emergencies was established in 1973 to operate on a high frequency unique side band reserved for medical calls. Case-history examples are outlined for instances of diverting an aircraft for an emergency landing, noting the necessity of providing for medical services at airports in different countries in order to provide life-saving medical care to seriously ill passengers. M S K

**A82-38847 Standards of physical condition for private pilots of aircraft and gliders (Normes d'aptitudes médicales des pilotes privés d'avions et de planeurs).** J M Masson (Tours, Université, Tours, France) and R Auffret (Centre d'Essais en Vol, Laboratoire de Médecine Aérospatiale, Bretigny-

sur-Orge, Essonne, France) *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 37-39 In French

The establishment of legal jurisdiction and the levels of health necessary for the obtaining and renewal of a private pilot's and glider pilot's license in France are discussed. The standards are noted to agree in the most part with international agreements, particularly the Chicago Convention of 1944 which required each signatory nation to ensure that pilot health standards were met domestically. The doctor who qualifies a private pilot is held directly responsible for any accidents or injuries which result from a debilitating physical condition which existed during the physical examination. A medical examiner is empowered to request a review or supplementary tests, including sonograms, ECG, and more frequent tests after the pilot reaches 40 years of age. Particular visual acuity, color perception and aural competency levels are outlined. M S K

**A82-38848 Aerobatics in light aircraft - Sensations and stresses experienced by the pilot (La voltige sur avions légers - Sensations et efforts subis par le pilote).** C Lelaie *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 40-42 In French

Physical stresses experienced by pilots of light aircraft during spins are categorized into stresses from pitching motion in the vertical plane and angular accelerations in rolls or side slip. An increase in g forces of from 3.8 to 8 times normal can be incurred. The same forces can be induced in rolls and square and octagonal loops, where the maneuver places a maximum structural strain on the aircraft for a short period of time. A chief danger is in greying or blacking out of vision, which occurs in degrees depending on the pilot's physical condition and ability to concentrate, and may be lessened in effect by contraction of the abdominal muscles. Planning the rhythm of the maneuvers before entering the rolls is noted to be necessary in order to retain control. The geometry of aircraft rolls is examined, and it is noted that female pilots have displayed a greater capacity for the physical stresses of extreme maneuvers than males. M S K

**A82-38849 Medico-physiological aspects of stunt-flying (Aspects médico-physiologiques de la voltige aérienne).** A Leger (Centre d'Essais en Vol, Laboratoire de Médecine Aérospatiale, Bretigny-sur-Orge, Essonne, France) *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 43-47 In French

Physiological stresses encountered by a pilot during aerobatic maneuvers may be manifested in cardiovascular, sensorial, hormonal, and psychological effects. Cardiovascular consequences are caused by linear accelerations in the head-buttock axis which produce both positive and negative loadings. Rotations about the same body axis produce sensory disorientation, arising from input to sensory neural receptors which have evolved for ground-based activity. Increased g forces during flying maneuvers are tolerated inversely to the magnitude of the increase, and depend on the state of fatigue, hypoglycemia, presence of alcohol, and the heat of the environment in which the pilot sits. A neural model is assumed to physically exist, which stores possible tolerable orientations, shifts of orientations, and accelerations which a human might encounter, and the introduction of sensations, shifting scenery, and accelerations on otolith organs is noted to create a conflict between stimulated organs and expectations, leading to the onset of motion sickness. M S K

**A82-38850 Physiological stresses in flying a sailplane (Les contraintes physiologiques du vol-à-voile de performance).** J P Crance and M Pittaco (Nancy I, Université, Vandœuvre-les-Nancy, Meurthe-et-Moselle, France) *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 48-50 In French

Flying a sailplane requires constant attention, sometimes to the extent of 19-20 hr/day. Consciousness must be focused efficiently on the ambient meteorological conditions, the instruments, navigation, and obstacles which threaten collision. Continued deteriorating flying conditions, a lack of a place to land, and even a lack of experience can lead to anxiety, fatigue, and errors in judgment. Sitting for long periods with the body inclined to the vertical by 40-50 deg, arms extended, feet reaching the control pedals, and back in a bent posture can result in a pathological lumbar condition. Severe changes in interior cabin temperature can be experienced among different terrains and at varying heights and exacerbated by sweating. Respirators must be used after an hour of flying at 4000 m, or 4 hr at 2500-3500 m, or a 20 percent reduction in mental workload capacity occurs. Finally, hypoglycemia is a danger if a substantial meal is not consumed shortly before take-off for a long flight. M S K

**A82-38851 In-flight incapacitation and pathology for the light aircraft stunt-flyer (Incapacités en vol et pathologie de la voltige aérienne en avion léger).** B Froissart, A Hermant, and A Milhaud *Médecine Aéronautique et Spatiale*, vol 21, 1st Quarter, 1982, p 51-56 9 refs In French

The physiopathology of stunt flying is examined in terms of the stresses and effects induced by vertical angular accelerations. A total of 109 responses were received from questionnaires distributed to pilots, asking 400 questions regarding physiological phenomena observed by the pilots during and after stunt-flying episodes. The subjects' responses were categorized by the level of experience and type of activity. Specific queries were devoted to vertiginous and disorienta-

tional experiences, painful vertebral syndromes, black-out, loss of consciousness, convulsive trembling in the jaw or hands, and hiatal hernias during negative acceleration. A further investigation of causes of incapacity which led to accidents and fatalities revealed factors such as alcohol consumption before flight, and accelerations exceeding tolerance levels. The pathology of stunt-flying was found to be dominated by vertebral symptomatology and problems with equilibration.

M S K

**A82-38852 The clinical selection of astronauts at the C.P.E.M.P.N. (La sélection clinique des spationautes au C.P.E.M.P.N.).** R. Carre. *Médecine Aéronautique et Spatiale*, vol. 21, 1st Quarter, 1982, p. 57-59. In French.

The process of clinically qualifying astronaut candidates at the French CPEMPN in Paris is reviewed. A medical history dossier is completed by the family doctor and the candidate before a one week clinical examination begins. An ECG is then taken for a 24 hr period, along with heart radiography, peripheral pulse readings at different points, ECG readings during maximal exercise, and phonocardiography at four frequency bands. Spirography is employed to assess ventilatory functioning, capacity, and reserves. An EEG trace is obtained in normal and hyperventilation conditions, and thorough examination is made of the lymphatic system, the thyroid, the genitals, rectum, and the abdomen by palpitation. All areas of the body are X rayed and laboratory tests are run in hematology, serology, urinalysis, parasitology, blood chemistry, and enzymatic activity. Clinical and functional appraisal of the ophthalmological status is obtained and dental health is assessed. Conditions of rejection are discussed.

M S K

**A82-38853 Vestibular screening of cosmonauts (Sélection vestibulaire des cosmonautes).** A. Leger and G. Bezamat. *Médecine Aéronautique et Spatiale*, vol. 21, 1st Quarter, 1982, p. 60-63. In French.

The methods employed in the first French clinical examinations of vestibular tolerances of astronaut candidates at the CEMPN are reviewed. Closely following Soviet practices, the candidates are exposed to a continuous application of Coriolis accelerations. Candidates are strapped into a seat which can be made to spin at 0-8 turns/sec, with monitoring proceeding on vital physiological parameters. Trials are performed in short spin modes at 180 deg/sec, constantly reversing the direction of motion, and in a long mode where spinning continues for tens of seconds, with the subject occasionally required to tilt his (her) head in response to an auditory signal. Questionnaires are filled out regarding the candidate's subjective assessment of motion sickness experiences. Assessments are made of the degree of nausea encountered, both from candidate reports and from measurements of arterial pressure. The severity of the tests is regarded as suitable in order to avoid onsets of motion sickness in actual flights.

M S K

**A82-38854 Orthostatic tests during cosmonaut selection (Tests d'orthostatisme lors de la sélection des cosmonautes).** J. L. Poirier (Centre d'Essais en Vol, Laboratoire de Médecine Aéronautique, Bretigny-sur-Orge, Essonne, France). *Médecine Aéronautique et Spatiale*, vol. 21, 1st Quarter, 1982, p. 64-71. In French.

Techniques for assessing the orthostatic tolerance to weightlessness by assessing the lower body negative pressure before flight are described. The lower part of the body is exposed to a lower barometric pressure than the upper part by placing the lower body in a neoprene-sealed cylinder. Another test is performed wherein the subject is fixed in a web on a table and tilted back, head down, at different inclinations lasting 10 min each, interspersed with five minutes in the horizontal position. Continuous monitoring proceeds of ECG, arterial pressure, and the volume variation and blood flow in the lower leg. The state of return circulation in the lower extremities is thus assessed, following the results of trials performed on board Spacelab. An assessment of the tolerance to orthostatic changes in the distribution of bodily fluids encountered during the first few hours of spaceflight and the level of hypotension which will be sustained in the first week after returning to the ground is possible with the techniques.

M S K

**A82-39159 Mechanical chemical and bio-hazards.** S. M. Siegel (Hawaii, University, Honolulu, HI). *Advances in Space Research*, vol. 2, no. 3, 1982, p. 61-64.

Mechanical and chemical hazards resulting from space activities are briefly discussed, while biohazards are more extensively treated. The toxic materials that might be introduced into the atmosphere from mechanical and chemical space activity would be so slight in quantity as to pose no significant threat. Biohazards include contamination of other planets by terrestrial microorganisms, contamination of earth by extraterrestrial organisms, and contamination of earth by mutated terrestrial organisms exposed to space environments. It is concluded that the environment on other planets, including Mars, is completely inhospitable to terrestrial life forms, and that extraterrestrial forms would be so different from those of earth that they would be unable to survive in the biosphere or parasitize any organism on earth. No mutant capable of infecting or otherwise disrupting the earth's biosphere has ever been developed in scientific research, and any greatly mutated organism would not survive.

C D

**A82-39241 Pathomorphological investigation of the mechanism of cochlear damage caused by noise (Patomorfologicheskoe issledovanie**

**mekhanizma povrezhdenii ulitki shumom).** L. Voldrich (Ceskoslovenska Akademie Ved, Ustav Experimentální Mediciny, Prague, Czechoslovakia). *Vestník Otorinolaringologii*, July-Aug. 1982, p. 23-26. 7 refs. In Russian.

An investigation of the pathogenesis of inner ear damage in guinea pigs induced by excessive noise shows that excessive noise has a dual influence on auditory organs. Sound intensity that exceeds the limits of the mechanical rigidity of the exposed inner ear tissues (145 dB) destroys these tissues or their components. Repeated or prolonged exposure to sound at intensities not strong enough to mechanically destroy the structural integrity of the inner ear (90 dB) causes the auditory analyzer cells to die off due to an induced hyperactivity which results in the exhaustion of the cell's metabolic capabilities.

N B

**A82-39242 Alterations of histochemical organization in the organ of Corti under the influence of chronic noise (Izmeneniia v gistokhimicheskoi organizatsii spiral'nogo organa pri khronicheskikh shumovykh vozdeistviakh).** A. B. Karpanchev (Meditsinska Akademiia, Sofia, Bulgaria). *Vestník Otorinolaringologii*, July-Aug. 1982, p. 29-31. In Russian.

A histochemical investigation of receptor cell metabolism in the organ of Corti in guinea pigs is undertaken to study the effects of chronic noise exposure on aerobic and anaerobic metabolism. A high level of activity of two enzymes, succinic dehydrogenase and lactic dehydrogenase, indicators of aerobic and anaerobic metabolism respectively, is found in the outer and inner receptor cell zones of the receptor structures of the organ of Corti. When the animals are exposed to chronic noise (85-90 dB), the activity of these enzymes decreases in some experimental animals, as reflected by a lower concentration of the reaction product in the outer and inner receptor cells. In addition to cells showing a lower activity, some cells show very little alteration of the reaction intensity. These alterations are morphological and cytochemical expressions of adaptation, overstrain and primary degeneration of receptor cells.

N B

**A82-39243 Application of xylite for the detection of labyrinthine hydrops (Primenenie ksilita dlia vyivleniia vnutrilaбирintnogo gidropsa).** V. T. Pal'chun, V. I. Aslamazova, O. A. Buianovaia, and T. S. Poliakova (II Moskovskii Meditsinskii Institut, Moscow, USSR). *Vestník Otorinolaringologii*, July-Aug. 1982, p. 35-38. 10 refs. In Russian.

The use of xylite for detecting labyrinthine hydrops (Meniere's syndrome) is examined in order to find a compound more suitable for detecting this condition than glycerol, which has serious side effects and cannot be used in many patients. Xylite was administered in single oral doses of 0.75 to 1.5 g/kg body weight to 40 patients with Meniere's syndrome and its effects on auditory threshold values and several biochemical parameters of blood serum (potassium, sodium, sugar, total protein, osmolality) were studied. Xylite in doses of 1 to 1.5 g/kg body weight significantly increased the levels of sugar, potassium and osmolality and altered the auditory thresholds of the patients. The maximum dehydrating effect was obtained 2 hr after a xylite intake of 0.75-1 g/kg body weight and 1 hr after doses of 1-1.5 g/kg body weight, the latter being twice as fast as for a like amount of glycerol. Thus, xylite can be used effectively to diagnose Meniere's syndrome.

N B

**A82-39244 Alterations in the labyrinth receptors after laser irradiation as detected by electron microscopy (Elektronno-mikroskopicheskoe izucheniie izmenenii v retseptorakh ushnogo labirinta pri vozdeistvii lazera).** M. P. Nikolaev, V. F. Anichin, O. P. Tokarev, and Iu. L. Tverskoi (Moskovskaia Klinicheskaia Bol'nitsa imeni S. P. Botkina, Ministerstvo Zdravookhraneniia RSFSR, Moskovskii Nauchno-Issledovatel'skii Institut Ukhha, Nosa i Gorla, Moscow, Leningradskii Sanitar'no-Gigienicheskii Meditsinskii Institut, Leningrad, USSR). *Vestník Otorinolaringologii*, July-Aug. 1982, p. 39-44. 11 refs. In Russian.

Laser irradiation of the vertical semicircular canal in rabbits was conducted to assess its usefulness in the surgical treatment of ear diseases such as Meniere's syndrome. The receptor apparatus was examined by electron microscopy at periods of 1 hr, 3 days and 1 month following pulsed laser irradiation at 250 J/sq cm. The cellular structure was completely destroyed in the vertical semicircular canal within 1 hr after irradiation, but the cellular structure of the other receptors was not damaged, although erythrocytes were observed both in the endolymphatic space and in the interstitial tissues. After three days, again no structural elements were observed in the vertical semicircular canal. However, in the remaining receptors, several ultrastructural changes had occurred, including bending of the stereocilia on the apical surface of the ampullar receptor, an outflow of part of the supporting cells' cytoplasm into the endolymphatic space, and cytoplasmic vacuolization. No structural damage was found after 1 month, although there were ultrastructural changes in the myelin nerve fibers. Thus, laser irradiation exerts only a locally destructive effect on the semicircular canal, and the ultrastructural changes observed in the other ear receptors are general biologic actions which occur under the influence of external factors.

N B

**A82-39283 The cortical regulation of human motion (Korkovaia reguliatsiia dvizhenii cheloveka).** E. B. Sologub (Leningrad, Izdatel'stvo Meditsina, 1981. 184 p. 228 refs. In Russian).

The book presents results of the electroencephalographic study of systems in the cerebral cortex involved in the control of human motor activity. Problems



associated with the recording of EEGs during the performance of muscular work are considered, and techniques for EEG recording during intensive exercise are presented which are suitable for use under laboratory and field conditions. The general characteristics of EEGs during muscular work are then discussed, and the specific changes associated with particular motions are examined. The formation, characteristics, programming, actualization, regulation and noise tolerance of cortical functional systems controlling motion are then discussed, and the problem of the automatization of human motions is considered. Attention is also given to interhemispheric relations during motor activity, impairments in cortical systems of motor control in fatigue and neuroses, and the relation between cortical control systems and motion effectiveness. A L W

**A82-39286 † Otoneurological symptoms and syndromes (Otonevrologicheskie simptomy i sindromy).** N S Blagoveshchenskaia. Moscow, Izdatel'stvo Meditsina, 1981 328 p 146 refs. In Russian.

The book considers the auditory and vestibular symptoms and syndromes which are encountered as a result of cerebral and peripheral damage at various levels. Following a review of vestibular and auditory anatomy and physiology and the methods available for the study of the vestibular and auditory analyzers, symptoms and syndromes associated with impairments of these analyzers are discussed on the basis of vast clinical experience. Methods examined for the detection of vestibular symptoms include the recording of spontaneous nystagmus either visually or by means of electronystagmography, and vestibular tests involving caloric stimulation and rotation. The differentiation between peripheral and central vestibular syndromes is also considered, and the classification of vestibular disorders as a function of the phase of the disease and the degree of vestibular compensation is discussed. Clinical symptoms and syndromes indicative of auditory disorders addressed include noises, hyperacusis, and auditory hallucinations, and the use of the Weber experiment to differentiate between cochlear and retrocochlear lesions is discussed. A L W

**A82-39290 † Histamine in biochemistry and physiology (Gistamin v biokhimi i fiziologii).** I L Vaisfel'd and G N Kassil'. Moscow, Izdatel'stvo Nauka, 1981 280 p 710 refs. In Russian.

Various aspects of the way in which histamine figures in the physiology of human beings and animals are considered. Recent theories on the biosynthesis and metabolism of this widely distributed biogenic amine are presented, as are assessments of its importance in the neurohumoral regulation of bodily functions, in biochemical transformations, and in the diurnal rhythm of formation and excretion. Also considered are the normal working of histamine and its effect when it is interfered with in certain ways. Attention is given to the importance of the synthesizing and splitting enzymes that bind and liberate factors in the mechanisms by which histamine works on cells, organs, physiological systems, and the organism as a whole. The interaction of histamine with other biologically active substances, serotonin in particular, is discussed. C R

**A82-39416 † Current problems concerning the vestibulo-ocular interaction (Sovremennye problemy zritel'no-vestibuliarnogo vzaimodeistviia).** A A Mit'kin (Akademia Nauk SSSR, Institut Psikhologii, Moscow, USSR). *Uspekhi Fiziologicheskikh Nauk*, vol 13, July-Sept 1982, p 56-81 233 refs. In Russian.

Results of recent research on the tri-neural reflex arc linking the receptors of the labyrinth with the external muscles of the eyes are reviewed, emphasizing the plasticity and adaptivity of the vestibular-eye movement reaction, which is dependent upon the participation of many nerve structures and the close interaction of afferent-efferent mechanisms in various levels of integration. The main aspects that are discussed include the dual character of the link between the vestibular and ocular systems, the integrated functions of the vestibular nuclei, the role of the pontomedullary reticular formations in the organization of vestibulo-ocular responses, the adaptive changes in the vestibulo-ocular interactions conditioned by the vestibular section of the cerebellum, the participation of the central and peripheral zones of the retina in evaluating the parameters of movement and the postural reactions of an organism, and the unity of the mechanisms of the vestibular and optical nystagmus. N B

**A82-39417 † Systemic mechanisms of homeostasis (Sistemnye mekhanizmy gomeostaza).** A N Medel'ianovskii (Akademia Meditsinskikh Nauk SSSR, Moscow, USSR). *Uspekhi Fiziologicheskikh Nauk*, vol 13, July-Sept 1982, p 96-126 209 refs. In Russian.

A systemic theory of homeostasis is developed, in which the basic organizational forms of the inner medium that provide adaptive behavior for an organism in its interactions with the surrounding medium are considered. Graphic models of regulation mechanisms and the direct material-energetic interactions of the most important factors of an organism's inner medium are presented. These models are suitable for a general representation of structural mechanisms of homeostasis and for the formation of algorithms for bioregulation of artificial organs. The role of mechanisms for the search of optimal conditions of the inner medium is discussed, and the applied modeling of these mechanisms is considered. A quantitative method is developed for the analysis of the state of a functional system which maintains the conditions of the inner medium. This systemic

method is based on the modeling, separation, and synchronous registration of the values of the most important indicators, and the calculation of the indicators of the efficiency and the steadiness of the system. N B

**A82-39422 Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria.** J A Baross, M D Lilley, and L I Gordon (Oregon State University, Corvallis, OR). *Nature*, vol 298, July 22, 1982, p 366-368 27 refs. NSF-supported research, Contract No N00014-79-C-0004.

The results of chemical, physical, and microbiological analyses of microbial cultures obtained from eight hot water samples from black and white smoking chimneys and on a chimney wall obtained at the East Pacific Rise at 21 deg north are presented. The cultures were high in concentrations of H<sub>2</sub>S, Mn, and Fe and were found to be capable of growing in 86 C water. The culture from the hottest water held the highest amount of H<sub>2</sub>S, while the surrounding water had the lowest observed pH. Mixed cultures at 100 C displayed a 37-65 min generation time in a medium containing S, Mn, Fe, and NaHCO<sub>3</sub>, and were found to be giving off CH<sub>4</sub> and H<sub>2</sub>. The results are concluded to be important for the fields of prokaryotic evolution, marine geochemistry, industrial microbiology, and exobiology. M S K

**A82-39423 Ligation of oligonucleotides by pyrimidine dimers - A missing 'link' in the origin of life.** R J Lewis and P C Hanawalt (Stanford University, Stanford, CA). *Nature*, vol 298, July 22, 1982, p 393-396 22 refs. Grant No. NIH-GM-09901-20.

It is reported that thymidine oligonucleotides annealed to polydeoxyadenylate on DNA strands can be ligated end-to-end by UV irradiation by means of thymine dimerization of the terminal nucleotides in adjacent oligonucleotides. Direct photoreversal of the linkages is then possible with 254 nm UV radiation, although cleavage by the bacteriophage T4 endonuclease V, is not possible. Further discussion is given to the possibility that high molecular weight polynucleotides in primordial seas were generated from oligonucleotides by pyrimidine dimerization induced by solar UV radiation without a protective ozone layer. It is suggested that cyclobutane pyrimidine dimer which is hostile to DNA replication and survival in present day organisms once played a role in the prebiotic assembly of primordial genetic material. M S K

**A82-39426 † Abiogenic synthesis of the peptide bond. II (Abiogennyi sintez peptidnoi svyazi. II).** L N Moiseeva, R F Zaiats, and T E Pavlovskaya (Akademia Nauk SSSR, Institut Biokhimi, Moscow, USSR). *Akademiia Nauk SSSR, Izvestia, Seria Biologicheskaya*, Mar-Apr 1982, p 230-241 81 refs. In Russian.

Experimental approaches to abiogenic peptide synthesis in heterogeneous conditions are surveyed along with mechanisms of such synthesis. An examination of heterogeneous polycondensation of amino acids with the participation of their active forms indicates that mineral matrices can carry out catalytic functions, leading to different mechanisms of polycondensation for homogeneous and heterogeneous conditions, and to increased polymerization of amino acids. The specific character of abiogenic peptide synthesis in open systems is also considered. B J

**A82-39427 † Metabolism of the thermophilic hydrogenous bacterium *Pseudomonas thermophila* K-2 (Metabolizm termofil'noi vodorodnoi bakterii *Pseudomonas thermophila* K-2).** E E Emnova and A K Romanova (Akademia Nauk SSSR, Institut Mikrobiologii, Moscow, USSR). *Akademiia Nauk SSSR, Izvestia, Seria Biologicheskaya*, Mar-Apr 1982, p 271-283 39 refs. In Russian.

**A82-39428 † Mycelial fungi, isolated from the ice sheet of the central Antarctic (Mitsel'ial'nye gryby iz tolschhi lednika tsentral'noi Antarkitiki).** S S Abyzov (Akademia Nauk SSSR, Institut Mikrobiologii, Moscow, USSR) and L A Beliakova (Akademia Nauk SSSR, Institut Biokhimi i Fiziologii Mikroorganizmov, Pushchino, USSR). *Akademiia Nauk SSSR, Izvestia, Seria Biologicheskaya*, May-June 1982, p 432-436 23 refs. In Russian.

Microbiological analyses of core samples from the central Antarctic ice sheet have identified various microorganisms, including mycelial fungi preserved for a long period of time in a state of anabiosis. Attention is given to certain morphological peculiarities of the fungi, which are apparently associated with the long-term effect of extremal conditions. B J

**A82-39429 † Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations (Issledovaniia serdechno-sosudistoi sistemy v dlitel'nykh kosmicheskikh poletakh na orbital'nykh stantsiakh 'Saliut').** A D Egorov, I V Alferova, O D Anashkin, V I Bernadskii, Z A Golubchikova, M V Domracheva, O G Itsekhevskii, I I Kas'ian, V R L'amin, and A P Poliakova (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR). *Akademiia Nauk SSSR, Izvestia, Seria Biologicheskaya*, July-Aug 1982, p 485-498 38 refs. In Russian.

The effects of weightlessness on the cardiovascular system of cosmonauts during space flights lasting up to six months are investigated. Changes in blood circulation indicators measured at rest and during dynamic tests both during and after the flights showed no linear dependence on the length of the flight and, in general, did not increase with a lengthening of flights from one to six months. The changes in the central hemodynamics were reflected by an initial increase in the systolic volume and a longer, continuing increase from preflight levels in the circulatory minute volume. The changes in the phase structure of the cardiac cycle at rest were characterized by a reduction of the isometric phases of contraction and relaxation and a prolonging of both the sphygmocardi phase and the rapid filling phase. The regional hemodynamics showed an increase in the venous pressure of the jugular vein, and in the veins of the antebrium and the tibia. Also, several parameters of arterial pressure and the peripheral resistance showed a slight tendency to decrease. Functional tests conducted during and after the flights showed a decrease in the orthostatic tolerance and physical efficiency of the cosmonauts, but this decrease remained at a constant level during flights of up to 5-6 months. N B

**A82-39430 † The microflora of the central Antarctica glacier and control methods for the sterile isolation of an ice core for microbiological analyses (Mikroflora lednika Tsentral'noi Antarktiki i metody kontrolya steril'nogo otbora ledianogo kerna dlia mikrobiologicheskikh analizov).** S S Abyzov, V Ia Lipenkov, N E Bobin, and B B Kudriashov (AN SSSR, Institut Mikrobiologii, Moscow, Leningradskii Gornii Institut, Gosudarstvennyi Komitet po Gidrometeorologii i Kontroliu Prirodnoi Sredy, Arkhticheskii i Antarkhticheskii Nauchno-Issledovatel'skii Institut, Leningrad, USSR) *Akademiia Nauk SSSR, Izvestiia, Seria Biologicheskaiia*, July-Aug 1982, p 537-548 31 refs. In Russian

**A82-39431 Field sensitivity of the 'red' mechanism derived from primate local electroretinogram.** R M Boynton (California, University, San Diego, CA) and W S Baron (SRI International, Life Sciences Div., Menlo Park, CA) *Vision Research*, vol 22, no 8, 1982, p 869-878 25 refs. Grants No NIH-EY-01451, No NIH-EY-01579

Using the local ERG in response to a long-wavelength stimulus as an indicator, field sensitivity functions have been obtained from cynomolgus macaque monkeys (*Macaca fascicularis*) with flashed and sinusoidally flickering test stimuli. These functions show the reciprocal of the relative radiance, for various adapting wavelengths, required to reduce a 667-nm test response to a criterion level. The resulting functions resemble both Stiles' p<sub>1</sub> and the S sub R function of Smith and Pokorny, provided that p<sub>1</sub> and S sub R are displaced about 7 nm toward longer wavelengths, in agreement with microspectrophotometric evidence. When field sensitivity functions are obtained with a 20 Hz sinusoidal test stimulus, using a continuous change of field wavelength, the direction of a slow spectral traverse has a large effect upon the shape of the sensitivity and phase functions - a hysteresis effect. These effects do not occur at 5 Hz. The test light is proven to be ineffective upon G cones, and it appears unlikely that measurably significant signals are significantly induced into G cones as an indirect result of the modulation of R cones. Therefore, the steady background light absorbed in the G cones seems to be influencing the response of the R cones. (Author)

**A82-39432 Model of the accommodative mechanism in the human eye.** J F Koretz and G H Handelman (Rensselaer Polytechnic Institute, Troy, NY) *Vision Research*, vol 22, no 8, 1982, p 917-927 24 refs. Grant No NIH-EY-02195

**A82-39433 Effect of chromatic adaptation on the achromatic locus - The role of contrast, luminance and background color.** J S Werner (Colorado, University, Boulder, CO) and J Walraven (Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, Instituut voor Zintuigfysiologie TNO, Soesterberg, Netherlands) *Vision Research*, vol 22, no 8, 1982, p 929-943 54 refs

The influences of background chromaticity and luminance and stimulus contrast on chromatic adaptation are studied in an experiment involving a white test field superposed on a range of background colors. Stimuli were presented as a flashed annulus superimposed on a circular background field, with the observer task being to adjust the intensities of the two complementary test beams making up the stimulus so as to maintain an achromatic (white) appearance. The shift in chromaticity of the achromatic point is found to be in the direction of the chromaticity of the background, with the magnitude of this shift depending directly on background luminance and inversely on contrast. Results support a model of chromatic adaptation in which the transient test and steady background fields are nonadditive, in that the background field only affects the test flash by altering the gain of cone pathways, the Vos-Walraven cone spectral sensitivities are applicable, and a proportionality is found between the attenuation of dim and bright test flashes. A L W

**A82-39434 Neurons in cat visual cortex tuned to the direction of motion in depth - Effect of positional disparity.** M Cynader and D Regan (Dalhousie University, Halifax, Nova Scotia, Canada) *Vision Research*, vol 22,

no 8, 1982, p 967-982 30 refs. Medical Research Council of Canada Grant No MT-5201, Natural Sciences and Engineering Research Council Grants No A-0323, No A-9939, Grants No PHS-EY-02248, No AF-AFOSR-78-3711.

**A82-39435 Global visual processing for saccadic eye movements.** J M Findlay (Durham, University, Durham, England) *Vision Research*, vol 22, no 8, 1982, p 1033-1045 26 refs. Medical Research Council of England Grant No G977/865/N

Four experiments are reported in which saccadic eye movements are examined when the eye moves to targets in peripheral vision which consist of two discrete stimuli. It is found that under a variety of conditions, the saccade amplitude is such that the saccade lands at an intermediate position between the stimuli. This result has been termed the global effect and is interpreted as an influence of the global target configuration on the saccade amplitude. It is suggested that this phenomenon may be explicable in terms of activity in an ensemble of cells with large receptive fields. The experiments demonstrate the global effect in the situations of rapid automatic tracking, scanning for target detail and comparison of target configurations. The effect depends in a systematic quantitative manner on the properties of the visual stimuli. This may be loosely described by saying the saccade is directed to the center of gravity of the target configuration. But the saccades are generally directed closer to the near target than predicted by the geometric center of gravity. (Author)

**A82-39436 Retinal location and visual localization during pursuit eye movement.** L Mitrani and G Dimitrov (B'lgarska Akademii na Naukite, Institut po Fiziologia, Sofia, Bulgaria) *Vision Research*, vol 22, no 8, 1982, p 1047-1051 9 refs

Experiments were performed to measure the mislocation of a brief visual stimulus presented during pursuit eye movements in different places over the retina. The results obtained show that the mislocation for regions 5 deg from fovea in the direction of motion is greater than in fovea. This fact shows that some kind of reorganization takes place in the visual localization mechanisms during pursuit eye movements. The results cast doubts on the concept of 'perception time' which is often used to explain the visual mislocation phenomenon. (Author)

**A82-39437 Temporal sensitivities to square-wave gratings, saw-tooth-wave gratings and their fundamentals - More evidence for multiple spatial frequency channels in human vision.** T Nagano and K Yamagami (Ministry of International Trade and Industry, Electrotechnical Laboratory, Sakura, Ibaraki, Japan) *Vision Research*, vol 22, no 8, 1982, p 1053-1056 10 refs

**A82-39438 Discrimination and detection thresholds - The effect of observer criterion on the spatial properties of chromatic and achromatic mechanisms.** I R Moorhead and J E Saunders (City University, London, England) *Vision Research*, vol 22, no 8, 1982, p 1057-1060 9 refs

**A82-39439 Detection/discrimination in the long-wavelength pathways.** B A Wandell, J Sanchez, and B Quinn (Stanford University, Stanford, CA) *Vision Research*, vol 22, no 8, 1982, p 1061-1069 35 refs. Grant No NIH-5-R01-EY-03164-02

The simultaneous detection/discrimination method is applied to the mechanisms mediating the detection of long- and middle-wavelength test lights. The results suggest the following: (1) a test light detected by a signal initiated primarily in the long-wavelength receptors will be ultimately detected by different sets of nerve cells, depending upon the background illumination, (2) the discriminability of two test lights depends upon their duration, even when the lights are equated (at threshold) for visibility. (Author)

**A82-39440 Gravity and the tilt aftereffect.** J M Wolfe and R Held (MIT, Cambridge, MA) *Vision Research*, vol 22, no 8, 1982, p 1075-1078 18 refs. Grants No NIH-EY-01191, No NIH-EY-02621

Wolfe and Held (1981) have reported that, following monocular exposure to a tilt aftereffect-inducing stimulus, binocularly measured tilt aftereffects were significantly smaller than either monocularly or interocularly measured effects. Interocular effects are those measured in the eye not exposed to the adapting pattern. They are smaller than monocular effects. The present investigation has the object to provide support for an hypothesis considered in the earlier study, taking into account the difference between the chevron and tilted grating versions of the tilt aftereffect. The ability of gravity to alter the grating results but not the chevron results is found to suggest that the grating results are produced, in part, by a binocular process not active in the chevron experiment. The hypothetical binocular process would be subject to vestibular influences. G R

**A82-39448 † Abiogenic synthesis of the peptide bond. I (Abiogennyi sintez peptidnoi svyazi. I).** L N Moiseeva, R F Zaiats, and T E Pavlovskaiia (Akademii Nauk SSSR, Institut Biokhimi, Moscow, USSR) *Akademiia Nauk*

SSSR, *Izvestiya, Seriya Biologicheskaya*, Jan-Feb 1982, p 26-43 65 refs In Russian

Various experimental approaches for the abiogenic synthesis of the peptide bond in homogeneous and heterogeneous conditions are reviewed, and the likelihood of each of these processes being involved in the origin of life is examined. The role of the different energy sources, as well as the thermodynamic and physical requirements, in these processes is also discussed. Synthesis of the peptide bond under homogeneous conditions can occur in four general ways: thermal polycondensation of amino acids at high temperatures, polymerization of amino acids and their precursors under the influence of prebiological condensation agents of the carbodiimide type, polycondensation of amino acids with the participation of polyphosphate, and polycondensation of amino acids with the participation of aminoacyladenilate. Synthesis under heterogeneous conditions involves polycondensation of amino acids on the surface of minerals. N B

**A82-39507 # Selection and training of European astronauts (Auswahl und training Europäischer Raumfahrer).** K E Klein, J R Hordinsky, and L Vogt (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugmedizin, Bonn, West Germany). *Luft- und Raumfahrt*, vol 3, 2nd Quarter, 1982, p 35-38, 40-42 11 refs In German

Planning for the participation of European astronauts in the Spacelab mission is discussed. The historical development of the plan, the design concept for the spacecraft and lab, and the preliminary astronaut selection process in Europe are described, including the roles of ESA and NASA. Training for the mission is discussed, including training not directly concerned with the scientific goals of the mission and that directly concerned with the payload. The ESA training program is detailed, and ideas for furthering biomedical training are discussed along with training procedures using mission and experiment simulation. C D

**A82-39541 Lockheed involvement in Shuttle life sciences flight experiments.** T M Olcott (Lockheed Research Laboratories, Palo Alto, CA). *Lockheed Horizons*, Summer 1982, p 36-47

The goals, procedures, and equipment for the Shuttle life sciences program, which will assess effects of microgravity environment on humans, allow continuous observations of humans in space, and include exobiological experimentation are described. Physiological and metabolic changes caused by microgravity will be monitored, along with variations due to sex, motion sickness, and bone demineralization. The role of gravity in plant growth will be assessed, as will plant and animal gravity proprioceptive mechanisms, the interaction of gravitational forces and stress or light, and effects of microgravity over several generations. Details of the Spacelab facilities and experiments are discussed in terms of the use of a plant growth unit, and animal holding facility, a general purpose work station, a vestibular research facility, and accelerators and a centrifuge. M S K

**A82-39569 # Approaches to the study of the hypothalamus-pituitary gland relationship (Neki od pristupa izučavanju hipotalamus-hipofiza i mekhanizma povratne sprege).** P N Martinovich. In Collection of papers dedicated to Pavle Savic on the occasion of his 70th birthday. Belgrade, Srpska Akademija Nauka i Umetnosti, 1980, p 111-121 33 refs In Serbo-Croatian

Experimental studies relating to hypothalamus-pituitary gland relationships are summarized. Particular attention is given to ovulation induced in rats by mechanically produced lesions in the region of the pituitary stalk, the effects of X-rays on anterior hypophysis, and hypothalamus releasing factors and the control of the anterior pituitary function. B J

**A82-39570 # Modeling and simulation in the study of certain biological systems (Modelovanje i simulacija u ispitivanju nekih bioloških sistema).** Z Damjanovich. In Collection of papers dedicated to Pavle Savic on the occasion of his 70th birthday. Belgrade, Srpska Akademija Nauka i Umetnosti, 1980, p 123-131 In Serbo-Croatian

Various aspects in the use of mathematical models and computer simulation to study basic biological processes are examined. Particular attention is given to the use of simulation in studies of metabolism and excitability. B J

**A82-39743 Image orientation for RPV ground station crew.** R S Harvey (Army Personnel Research Establishment, Farnborough, Hants, England). In Remotely piloted vehicles, International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. Bristol, England, University of Bristol, 1982, p 24 1-24 7 6 refs

An experiment was carried out to determine the most appropriate image orientation for the crew in the ground station of a remotely piloted vehicle equipped with a steerable sensor. Such a sensor could provide imagery with a 'horizon-up' orientation or a 'specified-compass-direction' orientation. Each of these orientations has a different impact interpretation and vehicle navigation. (Author)

**A82-39749 Human factors of an RPV ground control station.** S J Page (Army Personnel Research Establishment, Farnborough, Hants, England)

In Remotely piloted vehicles, International Conference, 2nd, Bristol, England, April 6-8, 1981, Supplementary Papers. Bristol, England, University of Bristol, 1982, p 25 1-25 3 5 refs

The human factors of system design are concerned with the many facets of the man in the system. The range covers not only the design of the man-machine interfaces and the general working environment but also wider issues such as task performance, selection, training and job design. As part of a research programme studying the human factors of RPV systems, a ground control station simulator was commissioned. This paper reviews the evolution and use of this simulator as a system research and development tool. (Author)

**A82-39792 † The histochemistry of enzymes in specific skin glands of the European hedgehog (*Erinaceus europaeus*) during hibernation (Gistokhimiya fermentov spetsificheskikh kozhnykh zhelez evropeiskogo ezha /erinaceus europaeus/ v period zimnei spiachki).** V E Sokolov and N K Dzhemukhadze (Akademija Nauk SSSR, Institut Evoliutsionnoi Morfologii i ekologii Zhivotnykh, Moscow, USSR). *Akademija Nauk SSSR, Doklady*, vol 264, no 6, 1982, p 1492-1494 15 refs In Russian

**A82-39793 † The participation of the lymphatic system in the resistance of an organism to hypoxia (Uchastie limfoidnoi sistemy v rezistentnosti organizma k gipoksii).** V T Antonenko, N P Pen'kovskaya, and V I Danileiko (Kievskii Institut Usovshenstvovaniia Vrachei, Kiev, Ukrainian SSR). *Akademija Nauk SSSR, Doklady*, vol 264, no 6, 1982, p 1511-1513 13 refs In Russian

The relationship of changes in the cellular metabolism of the lymphatic system with the formation of resistance to altitude hypoxia is investigated. Mice were injected intraperitoneally with anti-thymocyte and anti-cytochrome sera and subjected to conditions equivalent to 11,000 m above sea level in an altitude chamber. The survival times of the mice increased by 5 and 10.4 times following injections (0.5 ml) of anti-thymocyte and anti-cytochrome sera respectively, while normal rabbit serum only slightly increased the survival times. In addition, anti-cytochrome injections induce decreases in the amount of lactic acid found in the liver, while after 24 hr the amount of lactic acid increases by 65-120%. The antihypoxic effect of the anti-cytochrome serum is linked with anti-cytochrome oxidase antibodies, since no antihypoxic activity remains after the serum is boiled. The antihypoxic effect is observed 30-60 min after the injections of anti-thymocyte and anti-cytochrome sera. N B

**A82-40277 # Experimentally determined pilot models using hovering VTOL flight data.** D Andrisani (Purdue University, West Lafayette, IN), S M Bourne, and C F Gau. *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug 9-11, 1982, Paper 82-1294* 12 p 10 refs Contract No. N62269-81-C-0729

It is pointed out that the successful design of manned aircraft and their flight control systems requires careful attention to the dynamic interaction of the pilot and the vehicle. The present investigation is concerned with this interaction for a hovering VTOL. The specific approach employed in the investigation involves the use of time domain parameter identification methods to determine the mathematical model of the human pilot. In connection with the conducted research the pilot was told to precisely hover a VTOL aircraft, the X-22A, over a landing pad which moved in semirandom step like manner. The reported research involves an attempt to obtain time domain pilot models from transient responses of a manned VTOL. Attention is given to the employed two-strategy pilot model, preliminary pilot model results using that model, and a discussion of problems involved with time domain pilot modeling. G R

**A82-40307 † Echocardiographic characterization of heart hypertension (Ekhokardiograficheskaya kharakteristika gipertonicheskogo serdtsa).** A I Sinopal'nikov. *Voenna-Meditsinskii Zhurnal*, June 1982, p 34-37 19 refs In Russian

An approach to the analysis of echocardiograms of the left ventricle in patients with hypertension is proposed. It is shown that this approach makes it possible to identify different types of heart hypertension as well as different stages in the evolution of such hypertension. This approach should lead to a greater differentiation of the types of antihypertension treatments. B J

**A82-40308 † Factors of the natural resistance of the body and methods for studying them (Fakторы estestvennoi rezistentnosti organizma i metody ikh izucheniia).** G A Bashmakov. *Voenna-Meditsinskii Zhurnal*, June 1982, p 38-40 18 refs In Russian

**A82-40309 † Diagnostics of disturbances of heart rhythm and conductance and their professional evaluation in flight personnel (Dagnostika narusheniia serdechnogo ritma i provodimosti i ikh ekspertnaia otsenka u letnogo sostava).** V I Kolodenok, V M Kondrakov, and N A Lysogor. *Voenna-Meditsinskii Zhurnal*, June 1982, p 46-49 10 refs In Russian

The paper describes an investigation of the incidence of heart arrhythmias and intracardiac blockades in flight personnel at rest and in conditions of measured physical loads. A large number of flight personnel ranging in age from 20 to 54

years were tested. Heart arrhythmias and blockades were revealed in 3.5% of the tested cases in a state of rest. Physical-exercise testing led to the disclosure of hidden disturbances of heart rhythm and conductance in 10.1% of the supposedly healthy subjects. Some recommendations on the professional evaluation of such disturbances are given. **B J**

**A82-40310 ↑** The content of cAMP and cGMP in brain tissues during adaptation to ischemia (Soderzhanie tsAMF i tsGMF pri adaptatsii tkanei mozga k ishemii). L. V. Govorova, A. G. Ziabkina, Kh. M. Markov, Sh. S. Tashae, and S. I. Teplov (Leningradskii Nauchno-Issledovatel'skii Neirokhirurgicheskii Institut, Leningrad, Akademiya Meditsinskikh Nauk SSSR, Moscow, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 68, June 1982, p. 752-757. 16 refs. In Russian.

The participation of the adrenergic and cholinergic systems in the adaptation of the brain to ischemia, caused by the occlusion of both common carotid arteries, is studied in rats. The dynamics of cAMP and cGMP levels in the cerebral hemisphere following ischemia induced in normal animals and in rats that have undergone cervical sympathectomy show that at the onset of compensatory reactions the adrenergic mechanisms are optimal, but during prolonged brain ischemia and severe brain damage the cholinergic reactions play the leading role. In addition, these findings support previous observations which show that parasympathetic influences determine the increase in the stability of animals to extreme hypoxia. **N B**

**A82-40311 ↑** The physiological mechanisms of the arousal response in animals under conditions of hypobiosis (Fiziologicheskie mekhanizmy 'storozhevoi reaktsii' u zhivotnykh v sostoianii gipobioza). S. A. Bugaev and E. V. Nikitina (Akademiya Meditsinskikh Nauk SSSR, Moscow, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 68, June 1982, p. 758-762. 9 refs. In Russian.

The arousal response is studied in rats during conditions of artificial hypobiosis as a means of investigating the mechanism of the animals' interrelation with the outside environment. The arousal response in rats during hypobiosis is characterized by an outburst of movement with a definite coordinated sequence of motion in response to a change of the animal's posture. Repeated responses of this type lead to a rapid accumulation of electromyographic activity and an increase in body temperature. These responses are more pronounced in heterothermic animals, and are accompanied by a restoration of the original body position and a significant increase in body temperature. This effective heat production in heterothermic animals during the arousal response is probably linked with the mechanism of 'special' awakening under conditions of reduced activity. **N B**

**A82-40312 ↑** Spatial organization of the vestibular influences on the cerebellar fastigial neurons of cats (Prostranstvennaia organizatsiia vestibuliarnykh vlianiy na neirony fastigial'nogo yadra koshki). V. A. Sarkisian (Akademiya Nauk Armianskoi SSR, Institut Fiziologii, Yerevan, Armenian SSR) and L. Simon (Akademiya Nauk Armianskoi SSR, Institut Fiziologii, Yerevan, Armenian SSR, Semmelweis Orvostudományi Egyetem, Budapest, Hungary). *Fiziologicheskii Zhurnal SSSR*, vol. 68, June 1982, p. 768-775. 20 refs. In Russian.

**A82-40313 ↑** The regulation of calcium exchange in the cells of different regions of the warm-blooded animal heart (O regulatsii obmena kal'tsiya v kletkakh razlichnykh otdelov serdtsa teplokrovnoogo zhivotnogo). V. V. Barabanova, V. Ia. Egorov, and T. A. Smirnova (Leningradskii Gosudarstvennyi Pedagogicheskii Institut, Leningrad, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 68, June 1982, p. 791-798. 10 refs. In Russian.

The effect of the specific calcium-regulating hormone calcitonin on the action potentials of contractile myocardium and pacemaker cells is studied in sexually mature and immature rabbits under conditions of a normal ionic environment and an increased calcium concentration. Results show that the regulating influence of calcitonin is exerted through the alteration of calcium ion transport in the electroexcitable channels of the membranes in various regions of the myocardium. The age specificity of the hormone's action is a result of the varying contributions of the different potential-forming ions to the action potential generation in the myocardium cells of animals of different ages. **N B**

**A82-40314 ↑** The changes in the concentration of free amino acids in muscles during exercise (Izmeneniia soderzhaniiia svobodnykh aminokislot v myshtsakh pri ikh usilennoi aktivnosti). A. A. Viru and A. K. Eller (Tartuskii Gosudarstvennyi Universitet, Tartu, Estonian SSR). *Fiziologicheskii Zhurnal SSSR*, vol. 68, June 1982, p. 799-803. 16 refs. In Russian.

The effect of exercise on the amino acid metabolism in rats is studied by determining the concentration of free amino acids in the quadriceps femoris muscle and the liver of rats which have been subjected to swimming for 1.5 hr with a load of 6% of body weight or 12 hr without load. Results show a decrease in the concentrations of free amino acids both in the quadriceps femoris muscle and in the liver after 1.5 and 12 hr of exercise. After 1.5 hr of exercise the concentration of alanine is sharply lower, although no further decrease in alanine concentration is observed after 12 hr of exercise. The total content of oxidizable amino acids (alanine, asparagine, valine, glycine, isoleucine, and leucine) is found to decrease after 1.5 hr of exercise, but increases after 12 hr of exercise. Thus,

prolonged muscular work seems to suppress the tissue catabolism of amino acids, as well as to suppress the glucose-alanine cycle in muscle. In addition, no pronounced change in the amino acid content of myocardial muscle is observed. **N B**

**A82-40315 ↑** The gradualness of the reaction of the pituitary-adrenocortical system to activating and inhibiting signals (Gradualnost' reaktsii gipofizarno-adrenokortikal'noi sistemy na aktiviruiushchii i tormoznyy signaly). A. I. Bogdanov, L. P. Filaretova, and A. A. Filaretov (Akademiya Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 68, June 1982, p. 804-808. 12 refs. In Russian.

The influence of electrical stimulation (0.3-1 mA) of the skin and injections of hydrocortisone (5-100 micrograms/kg body weight) on the functioning of the pituitary-adrenocortical system in rabbits is investigated. Results show that electrical stimulation of the skin of 0.3-0.7 mA induces a rise in the level of corticosteroids in the blood that is proportional to the electric current applied. However, an increase in the electric current to 0.9-1.1 mA results in a decrease of the hormonal response. Hydrocortisone intravenously injected immediately prior to immobilization of the rabbits for 90 min inhibits the response of the pituitary-adrenocortical system to the applied stress in proportion to the amount of hydrocortisone injected. **N B**

**A82-40316 ↑** Trace reactions of the frog tissue metabolism on changes of ambient temperature in the frog *Rana ridibunda* Pall (O sledovyykh reaktsiyakh tkanevogo metabolizma pri smene temperatur sredi u ozernoi liagushki *Rana ridibunda* Pall). G. I. Ibramova (Akademiya Nauk Kirgizskoi SSR, Institut Fiziologii i Eksperimental'noi Patologii Vysokogor'ia, Frunze, Kirgiz SSR). *Fiziologicheskii Zhurnal SSSR*, vol. 68, June 1982, p. 809-813. 16 refs. In Russian.

The influence of temperature compensation on frogs which have been acclimated to cold (7°C) and warm (17-22°C) environments is investigated by observing the metabolic shifts in the acclimated frogs upon changes in the ambient temperature. Moving a frog from a cold to a warm environment causes a significant decrease in the temperature coefficient (Q<sub>10</sub>) of the brain and skeletal muscle tissue respiration, a trace reaction, within a 1.4-24 hr period. However, moving a frog from a warm to a cold environment results in no change of the Q<sub>10</sub> value. The temperature coefficient of brain tissue respiration gradually begins to decrease after one hour following the transfer from a cold to a warm environment and reaches a minimum value after 24 hr. One hour after the transfer from a cold to a warm environment, the Q<sub>10</sub> of skeletal muscles sharply increases (from 1.87 to 2.27). A plateau in Q<sub>10</sub> occurs during 6-18 hr after the transfer, and is followed by a decrease in Q<sub>10</sub> to 1.78 by the 24th hour. It is proposed that these responses are linked to a discordance between the permeability of the cell membrane and the activities of the cellular enzymes, which results in changes in the cellular enzyme/substrate ratios. **N B**

**A82-40435** Aging and visual function of military pilots - A review. R. Sekuler, D. Kline, and K. Dismukes (National Research Council, Assembly of Behavioral and Social Sciences, Washington, DC). *Aviation, Space, and Environmental Medicine*, vol. 53, Aug. 1982, p. 747-758. 83 refs. Contract No. N00014-80-C-0159. NR Project 201-124.

The results of the U.S. Navy Committee on Vision survey of existing data regarding sight impairment with age and its importance to the performance of military pilots are presented. Military pilot tasks which diverge from commercial pilot responsibilities are reviewed, noting that no data specifically concerned with military pilot vision was available. Attention is given to alterations in visual functions such as light transmission, dark adaptation, acuity, contrast sensitivity, dynamic visual acuity, oculomotor behavior, the visual field, depth perception, temporal resolution, visual information processing, and perceptual organization. Methodological problems inherent in conducting cross-sectional and longitudinal tests are discussed. Significant military pilot visual factors affected by age are concluded to include contrast sensitivity, dynamic acuity, glare recovery, night vision, and information processing. **M S K**

**A82-40436 \*** Rapid perceptual adaptation to high gravito-inertial force levels - Evidence for context-specific adaptation. J. R. Lackner (Brandeis University, Waltham, MA) and A. Graybiel (U.S. Navy, Naval Aerospace Medicine Research Laboratory, Pensacola, FL). *Aviation, Space, and Environmental Medicine*, vol. 53, Aug. 1982, p. 766-769. 12 refs. Contract No. NAS9-15147. NASA Order T-9140-E.

Subjects exposed to periodic variations in gravito-inertial force (2-G peak) in parabolic flight maneuvers quickly come to perceive the peak force level as having decreased in intensity. By the end of a 40-parabola flight, the decrease in apparent force is approximately 40%. On successive flight days, the apparent intensity of the force loads seems to decrease as well, indicating a cumulative adaptive effect. None of the subjects reported feeling abnormally 'light' for more than a minute or two after return to 1-G background force levels. The pattern of findings suggests a context-specific adaptation to high-force levels. (Author)

**A82-40437 \*** Antimotion-sickness efficacy of scopolamine 12 and 72 hours after transdermal administration. A. Graybiel (U.S. Navy, Naval Aeros-

pace Medical Research Laboratory, Pensacola, FL), D B Cramer (NASA, Washington, DC, U S Navy, Naval Aerospace Medical Research Laboratory, Pensacola, FL), and C D Wood (U S Navy, Naval Aerospace Medical Research Laboratory, Pensacola, FL, Louisiana State University, Shreveport, LA) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 770-772 6 refs NASA Order T-3384-G

The anti-motion sickness remedy, transdermal therapeutic system-scopolamine, administered in this experiment was scheduled to deliver 1.0 mg of scopolamine over a period of 3 d, and this paper compares its efficacy 12 and 72 h after administration. In a double-blind study, six male college students were individually exposed to a standardized provocative test in a slow rotation room after six apparently identical treatments comprising four placebos and two medications. Efficacy was categorized as beneficial, inconsequential, or detrimental. None of the responses was detrimental. Following the first administration of the therapeutic system, there were four beneficial responses after 12 h but none was beneficial after 72 h. Following the second treatment regimen, there were four beneficial responses after 12 h and three beneficial responses after 72 h. Great individual differences were demonstrated, two subjects accounting for six beneficial responses and two accounting for only one beneficial response. The difference in efficacy after 12 and 72 h has practical and theoretical significance. (Author)

**A82-40438 \*** **Dynamics of subjective discomfort in motion sickness as measured with a magnitude estimation method.** O L Bock and C M Oman (MIT, Cambridge, MA) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 773-777 27 refs Grants No NAG2-88, No NCC9-1

Eight subjects, wearing left-right vision reversing goggles, executed sequences of controlled active head movements to provoke motion sickness. Head movement sequences were interspersed with periods of eye closure and no head movement to permit partial remission of symptoms between sequences. Subjects reported the level of discomfort experienced by using a magnitude estimation technique derived from Stevens' (1957) ratio scaling method. Using this approach, we demonstrated that the time course of subjective discomfort exhibits a profile, similar in all our subjects, characterized by both fast and slow response components. The potential usefulness of magnitude estimation for research on the dynamic properties of the mechanism generating motion sickness symptoms is discussed. (Author)

**A82-40439** **Task categorization and the limits of human performance in extreme heat.** P A Hancock (Illinois, University, Urbana, IL) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 778-784 43 refs

A literature review is presented to synthesize data for the effects of extreme thermal stress on human performance in tasks of mental and cognitive skill, tracking, and complex or dual task performance. In the first category, it was found that the limit for unimpaired mental performance was close to the thermophysiological limit, with core temperature tolerance set at 1.0 F and mental performance being impaired when core temperature was raised 2.4 F. Tracking performance displays a higher decrement, with onset beginning at 1.6 F rise in core temperature. Concurrent task performance was determined to be subject to inefficiency once core temperature rises 0.4 F. Task complexity induces earlier heat stress-related losses of efficiency, and can be partially compensated for in terms of operator skill. (Author)

**A82-40440** **Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments.** Y Shapiro, K B Pandolf, M N Sawka, M M Toner, F R Winsmann, and R F Goldman (U S Army, Army Research Institute of Environmental Medicine, Natick, MA) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 785-789 15 refs

Twelve male subjects were exposed to hot-wet and hot-dry climatic conditions while wearing either air- or water-cooled vests in addition to nominal tank crew clothing, i.e., chemical protective uniforms. Metabolic rates were monitored in terms of heart rate, skin temperature, sweat rate, weight losses, and O<sub>2</sub> and CO<sub>2</sub> concentrations in the breath, while the convective heat transfer, radiative heat transfer, and the maximal evaporative cooling capacity were calculated. A lesser cardiovascular strain was found for the ventilated air-cooled vest conditions, while other parameters were equal in the hot-wet conditions. Neither type of vest furnished any sweat rate reduction in the hot-dry conditions, and the air-cooled vest was noted to potentially cause skin damage in a hot-dry environment due to high velocity hot air. (Author)

**A82-40441** **Thermoregulation and the menstrual cycle.** S M Horvath and B L Drinkwater (California, University, Santa Barbara, CA) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 790-794 27 refs Grants No NIH-LR01-ES-00849, No NIH-5-R01-OH-00896

Eight women subjects performed exercise to 30% maximum oxygen volume uptake in 28 C-12.6 torr, 35 C-28 torr, and 48 C-8.7 torr conditions as part of trials to determine whether plasma concentrations of estradiol and progesterone associated with ovulatory, luteal, and flow phases of the menstrual cycle affect female response to exercise in warm and hot environments. The cycle day was chosen by means of body temperature or physical evidence. Each subject performed 90 m/min treadmill exercise as the grade increased 1 deg/min to verbally announced tolerance levels. Blood volume, body density, ECG, rectal tempera-

ture, skin temperature at seven sites, blood pressure, hematocrit, etc. were monitored and each exercise was performed in a pressure/temperature controlled chamber. The hormonal changes during the phases of the menstrual cycle were found to not affect the ability to exercise. (Author)

**A82-40442** **Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting.** E Shvartz, J G Gaume, R C Reibold, E J Glassford, and R T White (Douglas Aircraft Co., Long Beach, Mercy Hospital and Medical Center, San Diego, CA) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 795-802 14 refs

Eight young men were twice administered - on two different days - a series of hemodynamic (using an impedance plethysmograph), subjective, and skin temperature measurements during 5 h of quiet sitting. On one day, a Circutone seat (massage-type seat cushion) was activated for 14 min/h, and on the other day it was not. During the 'Circutone off' day, 5 h of sitting resulted in a continuous decrease in calf blood flow and an increase in venous blood pooling in the calf, an increase in blood pressure and a stable cardiac output (4.6 l/min), very low urine output, large increases in skin temperatures at the body areas in contact with the seat (thigh and lower back), and increases in various subjective responses of discomfort. The Circutone activation resulted in a substantial exchange of the stagnant blood in the calf and thigh, a tendency to increase thigh and calf blood flow, a decrease in venous pooling in the thigh, and less subjective discomfort. The Circutone activation had no effect on skin temperature. The results indicate that the Circutone seat improved seat comfort by improving local circulation, especially in the thigh, which probably accounted for the improved subjective reactions. (Author)

**A82-40443** **Central nervous dysfunctions after near-miss accidents in diving.** R J Vaernes (Bergen, Universitetet, Bergen, Norway) and S Eidsvik (Naval School of Diving, Norway) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 803-807 19 refs

The possible differences in specific central nervous system functions in two groups of divers were studied: divers with a history of diving accidents (accident group, N = 9) and accident-free divers (non-accident group, N = 15). Both groups were characterized with a mean IQ level (WAIS) within the normal range. Of the nine accident group divers, eight showed abnormalities on neuropsychological tests implicating lesions on higher CNS levels. In addition, five of the accident group divers had a syndrome of subcortical/limbic dysfunctions - specific memory deficits, low autonomic reactivity, sustained attention problems, and emotional lability. The data confirmed previous findings that a severe diving accident may lead to cerebral dysfunctions. However, in contrast to the previous studies, it was found that divers with average intellectual levels can develop specific CNS dysfunctions after a near-miss diving accident. Therefore, it is concluded that a combined effect of emboli with multifocal lesions and/or a more specific effect on limbic structures represent the pathophysiology of a severe near-miss diving accident. (Author)

**A82-40444** **Neutron radiation dosimetry in high altitude flight personnel.** P E Baily (Texas, University, Houston, TX) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 808-817 29 refs

In an attempt to determine cosmic radiation exposure in high altitude NASA flight personnel, eight WB-57F flight crewmen were monitored for a period of six months using a combination radiation dosimeter. Each dosimeter consisted of two thermoluminescent chips capable of measuring gamma dose and one Albedo and two Track Etch neutron dosimeters. A total of 78 flights were monitored consisting of 251 flight hours at altitudes above 14 km (45,000 ft). The maximum yearly dose equivalent measured was 104 mrem, a value well below the Maximum Permissible Dose (MPD) of 5.0 rem/y for occupational exposures and 0.5 rem/y for members of the general public. A discussion of the theory and use of several types of neutron dosimeters is included. (Author)

**A82-40445** **The accuracy of venturi masks at altitude.** R B Stonehill (Indiana, University, Indianapolis, IN) and A G Peoples (Wishard Memorial Hospital, Indianapolis, IN) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 818-821 7 refs Research supported by the American Lung Association of Indiana

The concentration of oxygen provided in the inspired gas by five samples of a venturi mask were measured at ground level and at altitudes up to 10,000 ft for each of the oxygen port settings from 24-50% oxygen. The concentration of oxygen provided at a given setting was virtually identical for each of the five masks and was unaffected by ascent to 10,000 ft. Thus, patients with chronic hypercarbia could receive 'low flow oxygen therapy' while traveling on commercial airlines without danger of acute hypo-ventilation by utilizing a venturi mask. (Author)

**A82-40446** **Subjective response to negative air ion exposure.** L W Buckalew and A Rizzuto (USAF, Aerospace Medical Research Laboratory, Wright-Patterson AFB, OH) *Aviation, Space, and Environmental Medicine*, vol 53, Aug 1982, p 822-823 15 refs USAF-sponsored research

This study investigated specific subjective or psychological effects of relatively long exposure to negative ions generated by a conventional air purification de-



vice Subjects - 24 males matched for age, education, physical condition, and smoking habits - were divided into a control (N=12) and an ion exposure group (N=12). The groups were subjected to 6 h normal and negatively charged atmospheres, respectively. The tests used were the Taylor Manifest Anxiety Scale (TMAS) and a self-report mood index. The analysis of TMAS change scores clearly showed no effect of negative ion exposure on anxiety. Analysis of mood index data showed significant changes in the subjective perception of both physiological state (relaxation increased) and psychological state (irritability, depression, and tenseness decreased while calmness and stimulation increased).

(Author)

**A82-40447 † From a man-machine system to a social-engineering system (Ot sistemy 'chelovek-mashina' k 'sotsiotekhnicheskoi' sisteme).** A. A. Piskoppel' and L. P. Shchedrovitskii (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR). *Voprosy Psikhologii*, May-June 1982, p. 15-25. 22 refs. In Russian.

The concept of the man-machine system is examined. It is noted that this term covers at least three notions corresponding to three different ergonomical concepts: cybernetic, subject-oriented, and system-of-activity. Typical approaches to the definition of man-machine systems are examined in the light of this classification, and attention is given to the use of the concept of social-engineering systems in the framework of the system-of-activity approach.

B J

**A82-40448 † An absolute threshold in psychoacoustics (Ob absolutnom poroge v psikoakustike).** Iu. A. Indlin (Vsesoiuznyi Nauchno-Issledovatel'skii Kinfotoinstitut, Moscow, USSR). *Voprosy Psikhologii*, May-June 1982, p. 108-112. 14 refs. In Russian.

The discussion that has ensued since the concept of internal sensory noise was introduced is summarized. The results of experiments on the detection of a signal against a background of continuous noise are presented indicating the existence of a low sensory threshold. The internal sensory noise is continuous. Consequently, a signal can be detected against a background of this noise only when the sensory effect caused by the signal exceeds an absolute sensory threshold. The magnitude of this threshold depends on the statistical characteristics of the internal noise.

C R

**A82-40449 † A test for the prediction of risk-taking attitude in operators (Test dlia diagnostiki otnosheniia operatora k primatiu riska).** A. A. Kondratskii (Nauchno-Issledovatel'skii Institut Psikhologii, Ukrainian SSR). *Voprosy Psikhologii*, May-June 1982, p. 133-136. In Russian.

An apparatus designed to measure the inclination of subjects to take justified or unjustified chances, and to show unjustified (excessive) prudence, is described. The task to be performed by the subject is presented to him as a test of his sensorimotor abilities. The specific values of these inclinations are ascribed to a subject on the basis of comparing his choices of aims in consecutive trials with the actual level of his sensorimotor efficiency.

N B

**A82-40450 † Adapting a scale for measuring competition anxiety (Adaptatsiia shkaly sorevnovatel'noi lichnostnoi trevozhnosti).** Iu. L. Khanin (Vysshiaia Profsoiuznaia Shkola Kul'tury, Leningrad, USSR). *Voprosy Psikhologii*, May-June 1982, p. 136-141. 18 refs. In Russian.

Studies carried out in order to prepare a scale equivalent to that proposed by Martens (1974, 1977) are described. The intent is to make the scale suitable for use in cross-cultural studies. The Martens scale, which relies on questionnaires, is described.

C R

**A82-40451 † The effect of inotropic factors on the postexercise characteristics of the heart (Vliianie inotropnykh faktorov na postnagruzochnye kharakteristiki serdtsa).** Ts. R. Orlova, S. E. Ragimov, V. A. Shlain, M. P. Sakharov, and A. V. Trubetskoi (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Bulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 93, June 1982, p. 5-7. 5 refs. In Russian.

Acute experiments performed on cats show that the postexercise characteristics of the left ventricle plotted as a relationship between the magnitudes of the maximal blood flow velocity and systolic intraventricular pressure in normal cases and in cases of inotropic exposure are close to the linear ones. Adrenaline shifts the postexercise characteristics upward and to the right, increasing both the maximal magnitude of the blood flow velocity at zero pressure and the maximal magnitude of the pressure at zero blood flow. Calcium chloride and obsidian produce a parallel shift of the postexercise characteristics.

B J

**A82-40452 † A factor of resistance to emotional stress in the brain of rats (Faktor ustoiichivosti k emotsional'nomu stressu v mozge krysa).** E. A. Iumatov, Iu. G. Skotselias, N. A. Kovalenko, I. I. Votrni, K. V. Sudarkov, and S. S. Debov (I Moskovskii Meditsinskii Institut, Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Bulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 93, June 1982, p. 21-23. 13 refs. In Russian.

A factor that promotes resistance to emotional stress is extracted from the brains of rats that are highly resistant to chronic emotional stress, and causes increased resistance to stress in rats predisposed to stress. Brain homogenates of rats resistant to stress are extracted by several different methods, heat

treated, filtered on Sephadex G-15, and lyophilized. The fractions extracted, assumed to be small peptides, are low molecular weight, thermostable, and resistant to pronase hydrolysis. Injections of the partially purified stress resistance factor significantly (p less than 0.05) increases the resistance of the recipient rats to chronic stress.

N B

**A82-40453 † The correlations of the central nervous system and thyroid functions in conditions of chronic emotional stress (Korrelatsionnye otnosheniia funktsional'nogo sostoiianiia tsentral'noi nervnoi sistemy i shchitovidnoi zhelezy v usloviakh khronicheskogo emotsional'nogo stressa).** M. G. Amiragova and M. I. Arkhangel'skaia (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Bulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 93, June 1982, p. 24-27. 11 refs. In Russian.

The correlations of the central nervous system function, determined by the time course of changes in the EEG of the cortical and subcortical regions of the brain, and the content of thyroxine in the peripheral blood, are investigated in cats exposed to chronic emotional stress. In the course of stress, induced during one week by daily four-hour immobilization of the animals in combination with aperiodic electrical stimulation, it was observed that the EEG patterns show cycles of bursts of activity of slow waves, which are first recorded in the posterior hypothalamus. The bursts of slow waves then become generalized throughout the brain, and are accompanied by a high level of thyroxine secretion. As the stress exposures are repeated, the EEG changes intensify and the thyroxine secretions continue at a high level. For several days following the cessation of electrical stimulation, the cycles of bursts of slow wave activity accompanied by enhanced thyroid function are observable.

N B

**A82-40454 † The effect of hyperactivation of the anterior amygdaloid nucleus on heart activity during states of altered reactivity (Vliianie giperaktivatsii perednogo amigdalarnogo iadra na deiatel'nost' serdtsa v usloviakh ego izmenennoi reaktivnosti).** Iu. I. Pivovarov (Irkutskii Meditsinskii Institut, Irkutsk, USSR) and G. N. Kryzhanovskii (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Bulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 93, June 1982, p. 27-30. 15 refs. In Russian.

Changes in the heart reactivity of rats caused by injections of adrenaline, raisedeol, potassium chloride, and strophanthine facilitate the occurrence of cardiac rhythm abnormalities during the creation of the generator of pathologically enhanced excitation (GPEE) in the anterior amygdaloid nucleus. While the moments of rhythm abnormalities are correlated with the occurrence of GPEE epileptic activity, the pattern of cardiac rhythm abnormalities is largely determined by the specificity of action of the injected substances. Myocardial ischemia caused by the occlusion of the anterior or posterior left coronary artery causes cardiac rhythm abnormalities similar to those observed during GPEE creation in the nucleus. However, the differences in the pattern of cardiac rhythm abnormalities depend on the area of ischemia.

N B

**A82-40455 † Prevention of heart function abnormalities during reoxygenation after ischemia by adaptation to altitude hypoxia (Preduprezhdenie postishemicheskikh reoksigenatsionnykh narushenii funktsii serdtsa s pomoshch'iu adaptatsii k vysokoi gipoksii).** L. M. Belkina, V. A. Saltikova, E. E. Ustinova, and F. Z. Meerson (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Bulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 93, June 1982, p. 31-33. 10 refs. In Russian.

The influence of adaptation to altitude hypoxia (2100 m) on rat myocardial contractility is studied by means of transitory ischemia induced by ligation of the descending branch of the left coronary artery and subsequent reperfusion. Ischemia causes identical depressions of heart function both in animals adapted to hypoxia and in control animals, but after reperfusion only the adapted animals show a partial recovery of contractile function. In addition, evaluation of the heart function after ischemia and reperfusion demonstrates that the hearts of animals adapted to hypoxia have the capacity to withstand isometric loads equal to those attained during adaptation, while the control animals experience substantial disorders of heart function. Thus, it is demonstrated that adaptation to hypoxia increases the resistance of the heart to damages that occur during reoxygenation.

N B

**A82-40456 † Respiratory movements of the facial muscles and respiratory resistance (Dykhatel'nye dvizheniia litsevoi muskulatury i soprotivlenie dykhaniiu).** S. I. Frankshtein and Z. N. Sergeeva (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Bulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 93, June 1982, p. 33, 34. 8 refs. In Russian.

**A82-40457 † The use of hyperoxic mixtures for the diagnosis of latent disturbances in the external respiration system (Ispolzovanie giperoksicheskikh smesei dlia diagnostiki skrytykh narushenii v sisteme vneshnego dykhaniiia).** L. I. Uksusova and V. P. Nizovtsev (Kuibyshevskii Meditsinskii Institut, Kuibyshev, USSR). *Bulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 93, June 1982, p. 35, 36. 9 refs. In Russian.

**A82-40458 † The toxic properties of rabbit and dog sera under controlled hyperthermia (Toksicheskie svoistva syvorotki krolikov i sobak pri**

**upravliaemol gipertermii). V S Solov'ev** (Tiumenskii Gosudarstvennyi Universitet, Tyumen, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, June 1982, p 45-47 10 refs In Russian

The toxic properties of rabbit and dog blood sera obtained following controlled hyperthermia are studied in mice with reticuloendothelial system blockage, and mast cell degranulation is studied in rats during hyperthermia, in order to determine the linkage between the physiological response to hyperthermia and the functional condition of the mast cell system. The controlled hyperthermia enhanced the toxic properties of sera from rabbits and from dogs which had been given injections of thiopental sodium prior to hyperthermic treatment. Heating intensified the degranulation of mast cells in rats. In addition, the toxic properties of the sera are correlated with the rate of mast cell degranulation. It is concluded that the appearance of the toxic properties of the sera and the significant amount of mast cell degranulation during hyperthermia testifies to the systemic pattern of the pathogenesis of hyperthermia. N B

**A82-40459 † Diurnal changes in the duration of the S and G2 phases of the mitotic cycle in mononuclear and binuclear hepatocytes of normal and thyroxine-treated rats (Izmeneniia v techenie sutok dlitel'nosti S i G2-periodov mitoticheskogo tsikla v odno- i dvuiadernykh gepatotsitakh u normal'nykh i tiroksinizirovannykh kryss).** T V Savchenko and Iu A Romanov (II Moskovskii Meditsinskii Institut, Moscow, USSR) *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol 93, June 1982, p 94-96 6 refs In Russian

**A82-40460 † Occult bacterial persistence and resistance to colonization after antibiotic therapy (Skrytoe bakterionositel'stvo i kolonizatsionnaia rezistentnost' posle antibiotikoterapii).** N M Shustrova, O V Chakhava, A A Ivanov, and I N Gailonskaia (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii*, June 1982, p 50-53 8 refs In Russian

The enteral administration of antibiotics to mice and rats has been shown to induce the occult persistence of sporulating Gram-positive bacilli, inhabiting the intestine before the administration of the antibiotics. After the prolonged use of some antibiotics, the intestinal tract becomes an unsuitable environment for non-pathogenic *E. Coli*, which easily colonize the intestines of germ-free animals. This type of resistance to colonization is an unfavorable consequence of antibiotic therapy. B J

**A82-40461 † Cytogenetic effect of 5-fluoro-2desoxy uridine in the G2 phase on intact and X-irradiated crepis capillaris L cells (Tsitogeneticheskoe deistvie 5-flor-2-dezoksiuridina v G2-faze na intaktnye i obluchennye Rentgenovskimi luchami kletki crepis capillaris L).** R A Azatian, V A Avakian, and M S Zakarian (Akademiia Nauk Armianskoi SSR, Institut Eksperimental'noi Biologii, Yerevan, Armenian SSR) *Tsitologia i Genetika*, vol 16, May-June 1982, p 22-26 10 refs In Russian

**A82-40462 † The circadian rhythm of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles (Sutochnyi bioritm chuvstvitel'nosti khromosomnogo apparata myshei k mutagennomu deistviu virusa kori).** N N Il'inskikh and G D Gubin (Tiumenskii Meditsinskii Institut, Tyumen, USSR) *Tsitologia i Genetika*, vol 16, May-June 1982, p 59-62 20 refs In Russian

**A82-40463 † Vegetative reactions to the administration of atropine and propranolol in rats that exhibit different types of behavior (Vegetativnye reaktsii pri vvedenii atropina i propranolola u kryss s raznym kharakterom povedeniia).** N M Khonicheva (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, Moscow, USSR) and M A Bulgakova (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 433-441 22 refs In Russian

**A82-40464 † Dynamics of a stabilized motor defensive conditioned reflex for different levels of motivation in irradiated rats (Dinamika uprochnennogo dvigateľno-oboronitel'nogo uslov'nogo refleksa pri raznykh urovniakh motivatsii u obluchennykh kryss).** A S Shtemberg *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 463-471 18 refs In Russian

The total-body gamma irradiation of rats with superlethal doses is shown to produce phasic disturbances of a stabilized motor defensive conditioned reflex. As the radiation syndrome progresses, sharp fluctuations in the magnitude and relations of the main cortical nervous processes are observed, with an increase in the predominant role of transmarginal inhibition. The highest level of electrical defensive reinforcement provides for maximal strengthening of temporal connections and their high stability against severe stress impacts. B J

**A82-40465 † Characteristics of human auditory evoked potentials during the lateralization of a 'moving' auditory image (Kharakteristiki slukhovyykh vyzvannykh potentsialov cheloveka pri lateralizatsii 'dvizhushchegosia' zvukovogo obraza).** Ia A Al'tman, I M Belov, S F Vaitulevich, and

N V Mal'tseva (Akademiia Nauk SSSR, Institut Fiziologii, I Leningradskii Meditsinskii Institut, Leningrad, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 472-479 15 refs In Russian

Human auditory evoked potentials were studied during the dichotic presentation of acoustic signals which produce a sensation of directed movement of an acoustic image. Such signals cause the disappearance of the P1 component of the evoked potentials and the reduction of the latencies of the N1 and P2 components as compared with the corresponding characteristics of the components during monaural stimulation and binaural stimulation with a constant interaural delay of 900 ms, which produces complete lateralization of the acoustic image. B J

**A82-40466 † The influence of a constant magnetic field on the epileptogenic foci in the hippocampus of rabbits (Vliianie postoiannogo magnitnogo polia na epileptogennye ochagi v gippokampe krolikov).** L I Tyvin (Pediatricheskii Meditsinskii Institut, Leningrad, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 495-501 18 refs In Russian

The influence of a nonuniform magnetic field on rabbits injected with penicillin in the epileptogenic foci of the hippocampus, which gives rise to epileptic seizures, is investigated. Results show that for the control animals the activity between seizures and the number of electrographic correlates of seizures in the left hippocampus is significantly higher than in the right. Upon the application of the magnetic field, the number of epileptiform discharges between seizures remains relatively constant, but the number of electrographic correlates of the seizures increases. In addition, the interhemispherical difference in the epileptiform activity in the left and right hippocampus is accentuated in the experimental animals. A constant application of the magnetic field for 15 days does not result in any indication that the central nervous system of the animals adapted to the presence of the magnetic field. Finally, it is proposed that the effect of the magnetic field action on the experimental animals is similar to the influence of hypoxia. N B

**A82-40467 † Statistical analysis of neuronal impulse activity in the diencephalon during immobilization-produced emotional stress in rats (Statisticheskii analiz impul'snoi aktivnosti neironov mezhtutchnogo mozga pri immobilizatsionnom emotsional'nom stresse u kryss).** E A Kiliatkin (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 502-510 14 refs In Russian

**A82-40468 † The anti-stress role of the gamma-aminobutyric acid system of the brain (Antistressornaiia rol' gamkergicheskoi sistemy mozga).** B V Andreev, Iu D Ignatov, Z S Nikitina, and I A Sytinski (I Leningradskii Meditsinskii Institut, Leningradskii Institut Fizicheskoi Kul'tury, Leningrad, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 511-519 23 refs In Russian

The reactions of the gamma-aminobutyric acid (GABA) system during conditions of painful and emotional stress and the functional role of the GABA mechanisms during such conditions are studied in rats. It is found that emotional and painful stress disrupts the emotional and somatic status of the animal, and is accompanied by a rise in the level of GABA and an inhibition of GABA-transaminase in the forebrain, but not in the brainstem. Both gamma-vinyl GABA and gamma-acetylcholine GABA induce similar, but more pronounced, changes in GABA metabolism, reduce the number of gastric mucosal erosions, and lead to a greater metabolism of diazepam and mucin. In addition, gamma-vinyl GABA and diazepam also reduce the amount of behavioral depression following stress. GABA-negative compounds, such as picrotoxin and thiosemicarbazide, reduce the animals' resistance to stress. It is concluded that the directed activation of GABA transmission is one of the pathways of stress regulation. N B

**A82-40469 † The effect of the electrical stimulation of afferent pathways on neurons in septal slices (Vliianie elektricheskoi stimulatsii afferentnykh putei na neirony v srezakh septum).** S D Zhadina, O S Vinogradova, and A G Bragin (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 531-539 16 refs In Russian

**A82-40470 † Participation of the prefrontal cortex in delayed spatial choice and differentiation of time intervals in rhesus monkeys (Uchastie prefrontal'noi kory v otsrochnom prostranstvennom vybere i differentsirovani vremennykh intervalov u makak rezusov).** L A Moiseeva (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 549-552 5 refs In Russian

**A82-40471 † An LED system for the formation of visual stimuli (Sistema formirovaniia zritel'nykh stimulov na baze svetodiodov).** S A Pogrebinski (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Obshchei i Sudobnoi Psikhatrii, Moscow, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 569, 570 In Russian

A microcomputer-controlled LED system for the formation of visual stimuli is described, and a block diagram of the system is presented. This system satisfies the following requirements: (1) situation of the image in a single plane, perpen-

dicular to the line of sight, (2) a rapid succession of images (in a time less than 100 ms), (3) short exposure times (of the order of milliseconds), and (4) presentation of images in different halves and parts of the field of vision (angle of sight with respect to the horizontal of not less than 2 deg) B J

**A82-40472** † **Intrahemispherical relations of EEG slow-wave components in patients with local brain lesions (Vnutripolusharnye sootnosheniia medlennovolnovykh sostavliaushchikh EEG u bol'nykh s ochagovymi porazheniiami golovnogo mozga).** E V Sharova and M A Kulikov (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neirofiziologii, Moscow, USSR) *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol 32, May-June 1982, p 546-548 5 refs In Russian

**A82-40473** † **Robotics: Problems and prospects (Robototekhnika: Problemy i perspektivy).** I M Makarov *Akademiia Nauk SSSR, Vestnik*, no 5, 1982, p 51-60 In Russian

It is noted that by 1980 there were more than 100 models of industrial robots in the USSR, together with 7000 automated manipulators. These devices are mainly used to perform tasks that are hazardous or physically demanding. While formerly confined mostly to machine building, they are now being designed for use in mining, metallurgy, the food-processing industry, agriculture, construction, and light industry. The present five-year plan calls for 40,000-45,000 automated manipulators. C R

**A82-40474** † **As if in weightlessness (Kak v nevesomosti).** A Golikov and E Ettinger *Ogonek*, May 15, 1982 3 p In Russian

The simulation of weightlessness by means of hypnosis is described. Experimental results show that functional changes produced in the body during hypnotically induced weightlessness are similar to those produced in actual weightlessness. B J

**A82-40475** † **The combined effect of carbon monoxide and total-body vibration on the organism (O sochetannom deistvii na organizm okisi ugleroda i obshchei vibratsii).** V V Kustov, V G Litau, and S M Razinkin. *Gigiena Truda i Professional'nye Zabolevaniia*, June 1982, p 15-18 18 refs In Russian

The combined effect of carbon monoxide and vibration, with an accompanying noise of 90 dB, on white male rats is investigated. Results show that the combined effect of carbon monoxide and vibration enhances the development of carbon monoxide poisoning by delaying the normal development of hemoglobin compensation that is evoked by exposure to carbon monoxide. However, the effects of carbon monoxide and vibration on the level of carboxy-hemoglobin in the blood are not additive, i.e., the combined effect is less than the sum of their individual effects. In addition, the influence of vibration, as well as the combination of carbon monoxide and vibration, on the level of carboxyhemoglobin in the blood increases over the course of the experimental period, while the influence of carbon monoxide alone decreases. N B

**A82-40476** † **State of adaptation in patients with hypertension (Sostoianie adaptatsii u bol'nykh gipertonicheskoi bolezn'iu).** I S Zozulia (Kievskii Institut Usovshenstvovaniia Vrachei, Kiev, Ukrainian SSR) *Vrachebnoe Delo*, May 1982, p 72, 73 In Russian

Adaptive capacities of the auditory, visual, and motor analyzers are studied in 40 patients with cerebral hypertension (in hypertension stages 1 and 2). Results indicate that in the early stage of hypertension, the adaptive capacities of the auditory, visual, and motor analyzers are slightly decreased, but these decreases grow far more pronounced as greater cerebral atherosclerosis is manifested during later stages of hypertension. Normalization of these adaptive capacities is observed after treatment of the patients in the biotron. In addition, it is suggested that the variations in these adaptive capacities would be a useful indicator to differentiate the earliest stages of hypertension. N B

**A82-40477** † **The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension (Znachenie veloergometricheskogo testa v otsenke trudospособnosti bol'nykh gipertonicheskoi bolezn'iu).** O A Proskurkina, L G Garkusha, L G Stepanova, and I A Mikhailuk (Dnepropetrovskii Nauchno-Issledovatel'skii Institut Vostanovleniia i Ekspertizy Trudospособnosti Invalidov, Dnepropetrovsk, Ukrainian SSR) *Vrachebnoe Delo*, May 1982, p 70-72 7 refs In Russian

**A82-40478** † **The diagnostic value of phonoenterography in acute renal failure (Znachenie fonocenterografii dlia raspoznaniia ostroi pochecnoi nedostatochnosti).** P S Serniak, V K Denisov, V S Shirokov, and A P Prityka (Donetskii Meditsinskii Institut, Donetsk, Ukrainian SSR) *Vrachebnoe Delo*, May 1982, p 23-25 In Russian

**A82-40479** † **ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation (ATFaznaia aktivnost' eritrotsitarnykh membran i ikh pronitsaemost' dlia ionov kaliiia v usloviakh oblucheniia i pri deistvii serotoninina).** V V Zhegnevskaiia,

M F Vinogradova, and V V Polevoi. *Leningradskii Universitet, Vestnik, Biologiya*, May 1982, p 67-72 22 refs In Russian

**A82-40480** † **Changes of intracellular rest potential and the length of isolated muscle under different loads (Izmeneniia vnutriklettochnogo potentsiala pokoia i dliny izolirovannoi myshtsy pri razlichnykh ee nagruzkakh).** V S Darinskaiia, I D Il'chenko, and M I Sologub. *Leningradskii Universitet, Vestnik, Biologiya*, May 1982, p 62-67 27 refs In Russian

**A82-40481** † **Energy requirements of workers at an oil field in western Siberia (Potrebnosti v energii rabochikh-neftianikov Zapadnoi Sibiri).** G I Bondarev, V Ia Vissarionova, V S Dupik, T A Zemlianskaia, and S A Khotimchenko (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Voprosy Pitaniia*, May-June 1982, p 18-21 11 refs In Russian

**A82-40482** † **The role of nutrition in the changes of energy metabolism during stress (Rol' pitaniia v izmenenii energeticheskogo obmena v usloviakh stressa).** L E Panin and D I Kuz'menko (Akademiia Meditsinskikh Nauk SSSR, Novosibirsk, USSR) *Voprosy Pitaniia*, May-June 1982, p 15-18 11 refs In Russian

The effect of three different isocaloric diets, which differ in the ratios of proteins, fats and carbohydrates, on energy metabolism is studied in rats exposed to stress (swimming in an aquarium at different water temperatures). Results show that the high protein-lipid diet is the most desirable under stress, since this diet promotes the transition of energy metabolism from the carbohydrate type to the lipid type, and thus contributes to the development of adaptive changes in the body during extreme stress. In addition, analyses of kidney mitochondria show dissociation of oxidative phosphorylation and inhibition of ATPase activity in rats on normal and high carbohydrate diets, but these effects are not observed in rats on the high protein-lipid diet. N B

**A82-40484** † **An automated system for the collection and processing of cardiovascular information from athletes (Avtomatizirovannyi kompleks dlia sbora i obrabotki informatsii o serdechno-sosudistoi sisteme sportsmenov).** A P Grishanovich and A I Zav'ialov (Belorusskii Gosudarstvennyi Universitet, Minsk, Belorussian SSR) *Teoriia i Praktika Fizicheskoi Kul'tury*, May 1982, p 52, 53 In Russian

**A82-40485** † **A respirator for training in conditions of changeable respiratory mixture (Respirator dlia trenirovok v usloviakh izmenennoi dykhatel'noi smesi).** I M Epshtein (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Moscow, USSR) *Teoriia i Praktika Fizicheskoi Kul'tury*, May 1982, p 31, 50 In Russian

The paper describes a simple, portable respirator which does not require the chemical treatment of gases. The chief feature of this respirator is that it assures a moderate level of hypoxia and hypercapnia in the respiratory mixture. B J

**A82-40486** † **Somatotypology and athletics (Somatotipologiya i sport).** B A Nikituk (Gosudarstvennyi Tsentral'nyi Institut Fizicheskoi Kul'tury, Moscow, USSR) *Teoriia i Praktika Fizicheskoi Kul'tury*, May 1982, p 26-28 15 refs In Russian

An attempt is made to clarify the concept of somatotype (or constitution type) with particular reference to the application of this concept to athletics. The goals of somatotypology in athletics are defined as selective, metabolic, and explanatory of the reactivity and dynamics of ontogeny. Particular consideration is given to the norm of skeletal reaction to mechanical excitations, and to the growth (or development) dynamics of the body. B J

**A82-40487** † **Physical activity and human requirements for energy and food substances (Fizicheskaiia aktivnost' i potrebnost' cheloveka v energii i pishchevykh veshchestvakh).** V A Shaternikov (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR), M N Volgarev, and K A Korovnikov. *Teoriia i Praktika Fizicheskoi Kul'tury*, May 1982, p 22-26 In Russian

Tables are presented that list the requirements for a variety of nutrients. Both age and the type of work performed are taken into account, with the standards presupposing an ideal body weight. The nutritional needs of athletes are distinguished from those doing heavy labor, noting that the former require nutrients that will enable them to perform physically at a high level for a relatively short period of time. C R

**A82-40488** † **Increasing the efficiency of running on the basis of learning algorithms and information tools (Povyshenie ekonomichnosti bega na osnove ispol'zovaniia algoritmov obucheniia i informatsionnykh sredstv).** V L Rostovtsev (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Moscow, USSR) *Teoriia i Praktika Fizicheskoi Kul'tury*, May 1982, p 17-19 In Russian

A method is developed for increasing the efficiency of running which is based on the use of learning algorithms and information on heart rate and the main biomechanical parameters. The use of such algorithms and information tools considerably improves evaluation of the efficiency of running and makes it possi-

ble to determine a more efficient structure of running in one to three sessions. A decrease of vertical oscillations and stopping exertions was found to accompany the increase in running efficiency. B J

**A82-40489 †** **Psychic stress in athletic activity (Psikhicheskaya napriazhennost' v sportivnoi deiatel'nosti).** I B Viktorov (Sportkomitet, Latvian SSR), L N Golovnikov (Akademiya Pedagogicheskikh Nauk SSSR, Moscow, USSR), and A V Rodionov (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Moscow, USSR) *Teoriya i Praktika Fizicheskoi Kul'tury*, May 1982, p 13-15. In Russian

Experiments performed on boxers show that in stressful conditions there occurs a redistribution of the level of response to standard load (the morning response exceeds the evening one). Psychic components of stress predominate on days of a match. A series of control matches shows that adaptation occurs not only on the basis of the principle of functional economization but also on the basis of the principle of the homogeneity and heterogeneity of psychophysiological reactions. The heterogeneity of psychophysiological reactions can be accompanied by a negative effect of activity when it is connected with psychic functions that are largely responsible for the efficiency of the boxer. B J

**A82-40490 †** **X-ray study of loaded skeletal portions in the upper extremities of athletes engaging in karate (Rentgenologicheskoe issledovanie nagruzhaemykh otdelov skeleta verkhnikh konechnostei sportsmenov, zanimaushchikhsia karate).** S G Antonov and V N Shustov (Leningradskii Institut Fizicheskoi Kul'tury, Leningrad, USSR) *Arkhiv Anatomii, Gistologii i Embriologii*, vol 82, May 1982, p 71-77. 9 refs. In Russian

**A82-40491 †** **Cytoarchitectonics of the epidermis and the epidermal proliferative units /EPU/ (Tsitoarkhitektonika epidermisa i epidermal'nye proliferativnye edinitsy /EPE/).** G Ia Grafova (Voenno-Meditsinskaya Akademiya, Leningrad, USSR) *Arkhiv Anatomii, Gistologii i Embriologii*, vol 82, Apr 1982, p 73-85. 59 refs. In Russian

**A82-40492 †** **Peculiarities of the relief of the trabecular surface of the spongy substance of the human vertebrae (Osobennosti rel'efa poverkhnosti trabekul gubchatogo veshchestva pozvonkov u cheloveka).** A A Doktorov and Iu I Denisov-Nikol'skii (Ministerstvo Zdravookhraneniya SSSR, Nauchno-Issledovatel'skaya Laboratoriya Biologicheskikh Struktur, Moscow, USSR) *Arkhiv Anatomii, Gistologii i Embriologii*, vol 82, May 1982, p 61-70. 30 refs. In Russian

**A82-40493 †** **The response of the venous walls in the extremities to a disturbed venous outflow (Reaktsiya stenki ven konechnostei na narushenie venoznogo ottoka).** I M Baibekov and V A Khoroshaev (Akademiya Meditsinskikh Nauk SSSR, Tashkent, Uzbek SSR) *Arkhiv Anatomii, Gistologii i Embriologii*, vol 82, May 1982, p 45-51. 16 refs. In Russian

The dynamics of morphological changes occurring in the veins of rabbit and rat pelvic extremities are studied by means of light and electron microscopy at various time intervals of venous congestion produced by the ligation of the posterior vena cava. During early postoperative stages, lesions of the venous endothelium appear, and are manifested by an increased permeability of the endothelial cells, thickening of the borders between endothelialocytes, interaction with blood cells, exfoliation from the basal membrane, and an increased pinocyte activity. Later, the inner membranes of the venous walls thicken, at first due to the migration of blood leukocytes into the subendothelial layer, and then due to the appearance of a typical smooth muscle cells and fibroblasts. After 1-2 months, intimosclerosis begins to develop, collagenous fibers appear, and a proliferation of all types of cells in the venous walls takes place. The primary cause of the damage to the endothelial cells is hypoxia of the venous walls, which also results in phlebosclerosis of the venous wall structures. N B

**A82-40494 †** **Changes in neurons of the spinal cord and spinal ganglia under hypokinesia /neuromorphological and histochemical investigation/ (Izmeneniya neuronov spinnogo mozga i spinnomozgovykh uzlov pri gipokinezii /neuromorfologicheskoe i gistokhimicheskoe issledovanie/).** R A Nasyrov (Akademiya Meditsinskikh Nauk SSSR, Leningrad, USSR) and G V Kononov (Sempalatinskii Meditsinskii Institut, Sempalatinsk, USSR) *Arkhiv Anatomii, Gistologii i Embriologii*, vol 82, May 1982, p 27-32. 13 refs. In Russian

**A82-40495 †** **Afferent associative and commissural projections of the cortical vestibular zone VI of cats (Afferentnye assotsiativnye i komissural'nye proektsii korkovoi vestibuliarnoi zony VI u koshek).** F N Makarov and T F Kuleshova (Akademiya Nauk SSSR, Institut Fiziologii, Leningrad, USSR) *Arkhiv Anatomii, Gistologii i Embriologii*, vol 82, Apr 1982, p 25-30. 32 refs. In Russian

**A82-40496 †** **Age changes in the cerebral cortex of humans and cats /A comparative electron-microscopical investigation/ (Vozrastnye izmeneniya kory mozga cheloveka i koshek /Svrniten'noe elektronno-mik-**

**roskopicheskoe issledovanie/).** A S Iontov (Akademiya Nauk SSSR, Institut Fiziologii, Leningrad, USSR) and V F Shefer (Leningradskii Nauchno-Issledovatel'skii Psikhonevrologicheskii Institut, Leningrad, USSR) *Arkhiv Anatomii, Gistologii i Embriologii*, vol 82, Apr 1982, p 13-20. 24 refs. In Russian

**A82-40497 †** **The microcirculatory bed of the lungs after an effect exerted on the right vagus nerve (Mikrotsirkulatornoe ruslo legkikh pri vozdeistvii na pravyy bluzhdaiushchii nerv).** P N Aleksandrov, V I Chumakov, and V E Krasnikov (Akademiya Meditsinskikh Nauk SSSR, Moscow, Vladivostokskii Meditsinskii Institut, Vladivostok, USSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya*, May-June 1982, p 10-12. 8 refs. In Russian

**A82-40498 †** **The cause of high-altitude acute pulmonary edema (O prichinakh vysotnogo ostrogo oteka legkikh).** E M Ismailov (Kirgizskii Meditsinskii Institut, Frunze, Kirgiz SSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya*, May-June 1982, p 21-25. 6 refs. In Russian

The possible role of shifts in functional systems in the triggering of high-altitude acute pulmonary edema is examined. Attention is given to the significance of hypo- and hyper-proteinemia, hypo- and hyper-volemia, the blocking of alpha and beta adrenoreceptors, atropinization, glomectomy, increases in central blood volume and pressure in pulmonary vessels, and increases in the permeability of these vessels. B J

**A82-40499 †** **The early reaction of the hemopoietic organs to stress, depending on the condition of the peripheral M-cholinergic systems (Ranniya reaktsiya krovetvornykh organov na stress-vozdeistvie v zavisimosti ot sostoianiya perifericheskikh M-kholinoreaktivnykh sistem).** Iu B Deshevoi *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya*, May-June 1982, p 25-27. 10 refs. In Russian

Rats were subjected to six-hour immobilization during atropine block or aceclidine stimulation of the peripheral M-cholinergic receptors. It is shown that the injection of the agents did not produce any essential effect on the cellular reaction of the bone marrow and lymphoid organs to the immobilization stress. Atropine injection intensified while aceclidine injection reduced the degree of poststress lymphopenia and neutrophilia. B J

**A82-40500 †** **The effect of products erythrocyte destruction on immunological processes (Vliyanie produktov raspada eritrotsitov na immunologicheskie protsessy).** E G Kirdei and V I Nechaev (Irkutskii Meditsinskii Institut, Irkutsk, USSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya*, May-June 1982, p 27-30. 12 refs. In Russian

Tests performed on white mice showed that the products of erythrocyte destruction had a stimulating effect on the resistance to infection, antibody formation, blood serum bactericidal and complementary activity, granulocyte phagocytic activity, allograft rejection, and macrophage cytotoxic activity. These data indicate that erythrocyte-destruction products contribute to the regulation of the immune response by the activation of the macrophagal-granulocytic link of immunogenesis. B J

**A82-40501 †** **The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis (Sintez iadernykh mitokondrial'nykh DNK i RNK, sintez gema i globina v kostnom mozge krolikov pri stimulatsii eritropoeza).** Iu D Goncharenko and A D Pavlov (Riazanskii Meditsinskii Institut, Ryazan, USSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya*, May-June 1982, p 36-39. 18 refs. In Russian

**A82-40502 †** **The effect of hypokinesia on the resistance of the heart to hypoxia (O vliyanii gipokinezii na rezistentnost' serdtsa k gipoksii).** E A Markova, V M Gandziuk, and I L Popovich (Ternopol'skii Meditsinskii Institut, Ternopol, Ukrainian SSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya*, May-June 1982, p 46-50. 19 refs. In Russian

Experiments performed on white mice show that hypokinesia reduces the resistance of the heart to acute hypoxia and changes the character of the effect of adrenaline and inderal on the heart's tolerance to hypoxia. These data are explained from the vantage point of the heterochronous decrease in the synthesis of protein structures of the sarcolemma and the myocardiocytic sarcoplasmic reticulum during hypokinesia, as a consequence of which the cation pump capacity decreases and a change is produced in the relation between the effect of adrenaline on two differently directed processes, determining the efficiency of oxygen utilization by the mitochondria. B J

**A82-40503 †** **Changes in mineralized tissues in the case of calcitonin and somatotrophic hormone injections under hypokinesia (Izmeneniya v mineralizovannykh tkaniakh pri vvedenii kal'tsitonina i somatotropnogo gormona v usloviakh gipokinezii).** A I Volozhin and R A Druzhinina (Moskovskii Meditsinskii Stomatologicheskii Institut, Moscow, USSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya*, May-June 1982, p 64-67. 7 refs. In Russian

The effect of daily subcutaneous injections of calcitonin (CT) and somatotrophic

hormone (STH) on the structure of the femur and the alveolar process was investigated on unrestrained and hypokinetic rats. CT was found to activate osteogenesis and inhibit bone-tissue resorption to a greater extent in rats allowed free movement than in immobilized rats. STH injections given for 10 and 20 days did not have a protective effect on the bone when movements were restricted. CT injection was found to inhibit the development of a dystrophic in the alveolar process induced by long-term hypokinesia. B J

**A82-40504 † The effect of denervation and tendotomy on oxidative phosphorylation in the skeletal muscles of the rabbit and on the resistance of phosphorylation to uncoupling agents (Vliianie denervatsii i tendotomii na oksislitel'noe fosforilirovanie v skeletnykh myshtsakh krolika i rezistentnost' fosforilirovaniia k razobshchailushchim agentam).** M A Shvets (Akademiia Meditsinskikh Nauk SSSR, Leningrad, USSR) *Patologicheskaya Fiziologiya i Eksperimental'naya Terapiia*, May-June 1982, p 76-78. 10 refs. In Russian.

**A82-40560 # Psychological investigation of pilot behavior during integration of control systems in the cockpit of passenger airliners (Psychologische Untersuchung des Pilotenverhaltens Bediensystemintegration im Cockpit von Verkehrsflugzeugen).** F V Schick Braunschweig, Technische Universität, Naturwissenschaftliche Fakultät, Doktor der Naturwissenschaften Dissertation, 1980. 143 p. 27 refs. In German.

The influence of modifications in passenger airliner control systems on pilot behavior is experimentally investigated. The experimental setup is described in detail, including the division of labor in the cockpit, the simulated flight mission, and the choice of measurement and registration procedures. The data evaluation and results are discussed, including the influence of turbulence, control system component configuration, and practice on handling speed, as well as visual aspects. The results are interpreted for general aspects of control systems. C D

**A82-40642 † Higher integrative systems of the brain (Vysshie integrativnye sistemy mozga).** A S Batuev Leningrad, Izdatel'stvo Nauka, 1981. 256 p. 563 refs. In Russian.

The book reviews experimental data concerning the physiology of the association systems of the brain and their role in the formation of complex forms of behavior in animals and humans. Particular attention is devoted to the neuronal and synaptic organization and the neurophysiological characteristics of the higher association systems of the brain, the thalamoparietal and the thalamofrontal association systems. The features of the evolutionary and ontogenic development of the association systems, and their participation in the mechanisms of information processing and in the processes of the directing and programming activities of the brain are examined. Also discussed is the role of the association systems in the programming activities of the brain which are based on dominating motivations, and on the structural accuracy of the surrounding environment, resulting in the formation of the functional structure of behavioral acts. N B

**A82-40643 † Space gastroenterology (Kosmicheskaya gastroenterologiya).** K V Smirnov and A M Ugolev Moscow, Izdatel'stvo Nauka, 1981. 280 p. 375 refs. In Russian.

A monographic review of studies dealing with space gastroenterology is presented, with an emphasis on the results of studies of the digestive system of cosmonauts obtained during flights of the Soyuz and Salyut spacecraft. The introductory chapters are devoted to a general description of gastroenterological principles and methods, especially as applied to spaceflight conditions involving humans and animals. This analysis is followed by chapters devoted to different factors involved in space gastroenterology, including factors of spaceflight and the digestive system during hypokinesia and acceleration, the effect of space diet on the function of the digestive system, and the mechanism of the influence of spaceflight factors on the digestive system. A concluding chapter presents a synthesis of the general features of the functioning of the digestive system during spaceflight conditions. N B

**A82-40646 † Neurochemical mechanisms of learning and memory (Neirokhimicheskie mekhanizmy obucheniia i pamiati).** R I Kruglikov Moscow, Izdatel'stvo Nauka, 1981. 212 p. 515 refs. In Russian.

The roles of neurochemical systems and the metabolism of nucleic acids and proteins in the processes of learning and memory are reviewed. After a detailed survey of previous studies concerning the neurochemical mechanisms of learning and memory, the roles of the neuron mediating systems of the brain in the processes of learning and memory are analyzed, focusing on the cholinergic, serotonergic, and catecholaminergic systems. The metabolism of proteins in the brain and its relation to learning and memory are discussed. In addition, the mechanisms for the participation of the neuron mediating systems of the brain in the processes of learning and memory are examined, giving consideration to the interactions of the neuron mediating systems, the regulating influence of serotonin on the protein metabolism of the brain, and the role of the catecholamine mechanisms of the brain in the regulation of the chemoreactive properties of the cerebral neurons. N B

**A82-40649 Proceedings of a Meeting of the IUPS Commission on Gravitational Physiology.** *Physiologist, Supplement*, vol 22, Dec 1979 (1982). 88 p. (For individual items see A82-40650 to A82-40685).

Topics discussed include procedural approaches to gravitational physiology, methodological aspects of future cardiovascular research in space, and low-G simulation in mammalian research. Particular papers are presented on a rat model for the simulation of certain aspects of space flight, cardiovascular responses to isometric exercise during simulated zero gravity, the morphogenesis of a higher plant from cultured cells and embryos in space, and centrifuge high-g effects on temperature regulation in unanesthetized rats. Also considered are the effect of baroreceptor denervation on +Gz tolerance in dogs, the dynamics of weight loss during prolonged space flight, and the effects of horizontal hypokinesia on performance and circadian physiological rhythms in female humans. B J

**A82-40650 # Gravitational scale effects.** T A McMahon (Harvard University, Cambridge, MA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-5, S-6. 5 refs.

Some simple aspects of the performance of living organisms as a function of gravity and size are considered. Gravitational scale effects related to the walking and running of animals are considered, with particular attention given to a ballistic walking model, the walking of the Apollo astronauts on the moon is discussed. In addition, gravitational scale effects on trees growing on other planets (the moon and Jupiter) are examined. B J

**A82-40651 \* # Study of high-g effects in animals.** A H Smith (California, University, Davis, CA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-7 to S-10. NSF Grant No G-2255, Grants No NGR-05-004-008, No NSG-7493.

General aspects of animal centrifugation are examined. It is shown that once a covariance is established and the nature of the kinetics is determined it is possible to calculate a regression of the biological change (with suitable numerical transforms of the data) upon field strength. This should yield a rather simple equation containing two arbitrary constants  $a$ , the zero intercept (a mathematical prediction of the magnitude of the parameter  $y$ , when  $G = 0$ ), and  $b$ , the proportionality coefficient, the change in the parameter  $y$  per unit change in  $G$ .  $Y = a + bG$ . B J

**A82-40652 # Methodological aspects of future cardiovascular research in space.** K Kirsch, L Röcker, and H J Wicke (Berlin, Freie Universität, Berlin, West Germany) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-11 to S-14. 10 refs.

The exposure of man to a zero-g environment creates unique experimental conditions, which disclose certain functional characteristics of the cardiovascular system that might play an important role in terrestrial physiology. This paper describes instrumentation developed for cardiovascular studies in space flight. Particular consideration is given to (1) a device which permits repeated recording of the pressure in the antecubital vein, and (2) ultrasonic pulse equipment for studying fluid migration on the body axis. B J

**A82-40653 # Research opportunities and limitations of protracted hypogravity simulations for plant gravitational physiology.** A H Brown (Pennsylvania, University, Philadelphia, PA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-15 to S-18. 32 refs.

Various aspects of the use of clinostats for protracted hypogravity simulation on plants are examined. Consideration is given to the quantitative characterization of a plant's bioaccelerometer functions, the morphological dependence on the g-force, the determination of the persistence of circumnutation in the absence of a determining effect of gravity, the establishment of the g-dependence of a physiological trait over a range of g-levels, the exploration of the limits of the reciprocity rule, and the use of clinostats to simulate whatever g-condition may be planned for a space experiment. The limitations of the use of clinostats are also considered. B J

**A82-40654 \* # Low-G simulation in mammalian research.** H Sandler (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, CA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-19 to S-22. 23 refs.

After a review of space-flight research concerning the effects of weightlessness on mammals, the paper reviews various methods of low-G simulation. Consideration is given to water immersion, bed rest, chair rest, and confinement, immobilization, and partial body-support systems. Countermeasures to offset the effects of weightlessness are also discussed. B J

**A82-40655 \* # A new rat model simulating some aspects of space flight.** E R Morey, E E Sabelman, R T Turner, and D J Baylink (NASA, Ames Research Center, Moffett Field, CA, U S Veterans Administration Medical Center, Tacoma, WA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-23, S-24.



A rat suspension model to simulate the effects of weightlessness was developed by U S researchers coincident with U S involvement in Cosmos-satellite studies. This paper presents some preliminary data dealing with weight gain, food consumption, and bone formation in the rat model as compared with data from the Cosmos 782 and 936 experiments. It is shown that significant changes in bone formation rates may occur during a space flight lasting only five days. B J

**A82-40656 # Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system.** A Guell, A Bes, L Braak, and M Barrere (Centre Hospitalier Universitaire Rangueil, Toulouse, France) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-25, S-26 8 refs

A weightlessness simulation (seven days of prolonged bedrest in an antiothostatic position of -4 deg) was performed on four healthy human subjects. The parameters studied were the systolic time, the arterial resistance index, and the surface ratios and average velocity index which vary in the same sense as the cerebral blood flow. A significant increase was found in the systolic time from the 10th hour to the fourth day. The arterial resistance index increased during the first four days. The surface ratios and the average velocity index decreased significantly after the second hour and returned to the basal state after 48 hours. Qualitatively, a decrease was noted in the second positive wave of the sonogram, corresponding to a decrease in the arterial tonus. B J

**A82-40657 \* # Changes in blood volume and response to vaso-active drugs in horizontally casted primates.** D T Dickey, K K Teoh, H Sandler, and H L Stone (Oklahoma, University, Oklahoma City, OK) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-27, S-28 5 refs. Grant No NSG-2282

Experiments were performed on horizontally casted primates (male rhesus monkeys) in order to note changes in blood volume caused by horizontal restraint, to compare orthostatic tolerance before and after casting using the responses to upright tilting, to begin to uncover the cardiovascular and neural mechanisms involved in deconditioning, and to compare the data with that obtained from bed-rested human subjects and from humans exposed to weightlessness. Bolus injections of norepinephrine of 2.0 microgram/kg, phenylephrine of 4.0 microgram/kg, and nitroprusside of 2.0 microgram/kg were administered, and aortic pressure and heart rate were recorded during the injections. The results indicate that the horizontally casted primate is a valid animal model for studying the effects of simulated zero-G on the human cardiovascular system. B J

**A82-40658 # Human lymphocyte activation is depressed at low-g and enhanced at high-g.** A Cogoli, M Valluchi, J Reck, M Müller (Zürich, Eidgenössische Technische Hochschule, Zürich, Switzerland), W Briegleb (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugmedizin, Bonn, West Germany), I Cordt, and C Michel (Zürich, Universität, Zürich, Switzerland) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-29, S-30 Swiss National Science Foundation Grant No 3,109,077

**A82-40659 \* # Computer simulations of postural change, water immersion and bedrest - An integrative approach for understanding the spaceflight response.** J I Leonard (General Electric Co., Houston, TX), C S Leach, and J A Rummel (NASA, Johnson Space Center, Houston, TX) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-31, S-32 Contract No NAS7-14587

Mathematical modeling techniques were used to simulate the fluid electrolyte (F-E) responses during gravity unloading. It is shown that the response to weightlessness can best be understood by separately examining the acute (hours to days) and chronic (days to weeks) phases, and assuming the presence of normal, although complex, feedback regulatory processes. Headward shifts of fluid are shown to be primarily responsible for acute body losses of extracellular F-E. Losses of body water are closely related to the volume of fluid shifts from the legs. A diuresis is predicted within the first several hours of hypogravity, and this may be obscured by a reduced F-E intake, on Skylab, early F-E losses occurred primarily by deficit intake. B J

**A82-40660 # Effect of postural changes on minute ventilation, functional residual capacity and pulmonary N2 clearance.** E U Chae and S H Bae (Kyungpook National University, Taegu, Republic of Korea) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-33, S-34 5 refs

Respiratory responses to passive tilt were studied in anesthetized dogs that were tilted from horizontal to upright (+90 deg) and head-down (-90 deg) positions. The functional residual capacity (FRC) increased in the upright position and decreased in the head-down position. The decreased FRC was compensated by the increased minute ventilation, and an adequate percent oxygen saturation of arterial blood was maintained in the head-down position. On the other hand, in spite of increased FRC, minute ventilation was diminished and the lung clearance time was prolonged, and the percent oxygen saturation of arterial blood was decreased in the upright position. B J

**A82-40661 # Running in circles.** P R Greene and T A McMahon (Harvard University, Cambridge, MA) *Physiologist, Supplement*, vol 22, Dec 1979

(1982), p S-35, S-36

One technique for simulating the effects of enhanced gravitational acceleration on human locomotion is to have the individual run along a circular trajectory. Under these conditions, it is found that some parameters of the gait (i.e. top speed, ground contact time, and ballistic air time) change dramatically with the radius of the circle, whereas other parameters (i.e. stride frequency and step length) are essentially independent of the radius. Experimental results from 12 subjects are compared with a simple mathematical theory which assumes that the anti-gravity muscles have reached peak force. Theory and experiments agree quite well. Results are applied to the athletic question of running on a closed path, with the surprising conclusion that athletic tracks should be circular, not oval. (Author)

**A82-40662 # Cardiovascular responses to isometric exercise during simulated zero gravity.** F Bonde-Petersen, Y Suzuki, and T Sadamoto (Copenhagen, University, Copenhagen, Denmark) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-37, S-38 10 refs

Experiments were performed on six healthy males (age 21-35 years) in order to investigate whether blood pressure reflexes during isometric exercise are related to relative muscle strength applied, and whether these reflexes are influenced by simulated weightlessness (the supine position). It is shown that knee extension has the greatest impact on cardiovascular parameters, in addition, the cardiac output showed its greatest increase to above 10 l/min during contraction. Contrary to the results of Lind et al (1964), responses to isometric exercise at 40% MVC (maximal voluntary contraction) are found to depend on the muscle mass involved. B J

**A82-40663 # Effect of athletic training on physical fitness under hypodynamics.** H Saiki, M Nakaya, M Sudoh, M Abe, Y Taketomi, and M Naruse (Jikei University, Tokyo, Japan) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-39, S-40 6 refs

Twenty-nine healthy male adults were subjected to two weeks of vigorous athletic altitude training. As a result of training, such indicators as maximal oxygen uptake, flicker fusion value, and HPA reaction level, showed an increase of the physical fitness capacity, in addition, no decrease in orthostatic tolerance was observed. Water immersion exposure (six hours in head-out supine position) after training showed negative stress effects from the vantage points of the mineral and hormonal metabolisms. The results seem to indicate that an increase of physical fitness capacity, including orthostatic tolerance, can be achieved during training. B J

**A82-40664 \* # Effect of physical training in cool and hot environments on +Gz acceleration tolerance in women.** P J Brock, D Sciaraffa, and J E Greenleaf (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, CA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-41, S-42 13 refs

Acceleration tolerance, plasma volume, and maximal oxygen uptake were measured in 15 healthy women before and after submaximal isotonic exercise training periods in cool and hot environments. The women were divided on the basis of age, maximal oxygen uptake, and +Gz tolerance into three groups: a group that exercised in heat (40-6 C), a group that exercised at a lower temperature (18-7 C), and a sedentary control group that functioned in the cool environment. There was no significant change in the +Gz tolerance in any group after training, and terminal heart rates were similar within each group. It is concluded that induction of moderate acclimation responses without increases in sweat rate or resting plasma volume has no influence on +Gz acceleration tolerance in women. B J

**A82-40665 \* # Interaction of gravitic and mechanical stimuli in tropic and nastic responses in beans.** M J Jaffe (Ohio University, Athens, OH) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-43, S-44 7 refs. NASA-supported research

Experiments designed to explore the interaction of gravity and mechanical stimuli in the tropic and nastic movements of Cherokee Bush bean plants were summarized. When 10-day-old plants were rubbed just prior to presentation of the gravitic stimulus (by placing them on their sides), they displayed much less geotropic curvature than did nonrubbed controls. Geotropism could also be inhibited by rubbing even after it had been progressing for two hours. Wind from a fan could also inhibit geotropism, suggesting that this phenomenon also occurs in nature. B J

**A82-40666 \* # Morphogenesis of a higher plant from cultured cells and embryos in space.** A D Knikorian, F R Dutcher, C E Quinn, and F C Steward (New York, State University, Stony Brook, NY) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-45, S-46 Grant No NSG-7270, Contract No NAS2-10150

Reference is made to the Cosmos 782 experiment, which showed that cultured totipotent cells of carrot can give rise to embryos with well-developed roots but minimally developed shoots at near-zero g. The problem of whether the development of leafy shoots is sensitive to near-zero g conditions is considered. A test

system that would allow this problem to be resolved in a future space flight is described C R

**A82-40667 # Gravity sensing, polar transport and cytoplasmic streaming in plant cells.** J O Kessler (Arizona, University, Tucson, AZ) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-47, S-48 5 refs

**A82-40668 \* # Receptors signaling gravity orientation in an insect.** H B Hartman (Texas Tech University, Lubbock, TX) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-49, S-50 6 refs NSF-supported research, Grant No NSG-7435

Displacement in any direction from primary orientation is found to evoke tonic activity from at least one of the four interneurons of a certain type of burrowing cockroach, the receptive field for each interneuron is slightly more than a quadrant. The receptive field of each interneuron is found to be the same as the row of receptors providing the input. Displacement about the least stable axis (0-180 deg) or roll, on the one hand, and the most stable axis (90-270 deg) or pitch, on the other, is found to be unambiguously signaled by pairs of interneurons. Indications are obtained that receptors in the lateral row drive a giant interneuron in a contralateral connective and those in the medial row drive one in an ipsilateral connective C R

**A82-40669 \* # Bone growth and composition in weanling and mature rats exposed to chronic centrifugation.** L C Keil (NASA, Ames Research Center, Moffett Field, CA) and J W Evans (California, University, Davis, CA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-53, S-54 8 refs

The primary objective of the study is to determine the effect of continuous exposure to hypergravity on the development and composition of weight-bearing bone. The experimental results are seen to suggest that many, if not all, of the changes observed in bone growth and composition derive from the retarded growth rate of the centrifuged rats. Both centrifuged weanling and mature rats exhibit a significant reduction in femur length and mass. The changes in femur size are more apparent in the weanlings since they are exposed to hypergravity during their most rapid phase of skeletal development. In addition to a slower growth rate, the body mass of the mature and weanling animals is reduced even further by the depletion of body fat. The rapid loss of body fat observed in rats and mice during centrifugation, it is found, can produce a prompt and significant rise in relative femur mass after two weeks of exposure. After adaptation to centrifugation, however, relative femur mass is similar to that of controls at four and eight weeks. At 18 weeks, the centrifuged rats again exhibit an increase in relative femur mass. It is thought that this increase in relative femur mass may be generated by the difference in fat deposition between the 1-G controls and the high-G rats C R

**A82-40670 \* # Cardiovascular responses of the chronically instrumented monkey during simulated space flight.** E P McCutcheon, E Carlson, R C Mains, N Pace, D F Rahlmann, and H Sandler (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, California, University, Berkeley, CA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-55, S-56

A pod enclosure system designed by the Environmental Physiology Laboratory at the University of California at Berkeley is found to be eminently suitable for work with monkeys. The pattern of cardiovascular activity is found to vary. In the first half of the exposure, the hourly mean values suggest an initial period of instability, most marked for heart rate, beginning at 'launch'. In the second half of the exposure, the final three days, the responses appear much more ordered, with a stable phase relationship between circadian shifts in heart rate and mean aortic pressure. Since the latter stability is more normal, the assumption is made that the animal had become adjusted to its situation. Imposition of a daily lower body negative pressure (LBPN) stress shows characteristic responses C R

**A82-40671 \* # Centrifuge high-g effects on temperature regulation in unanesthetized rats.** J M Horowitz, E R Schertel, and B A Horwitz (California, University, Davis, CA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-57, S-58 Grant No NSG-2234

**A82-40672 # Effects of high-G on ventilation/perfusion in the domestic fowl.** S C Walgenbach, R E Burger, and A H Smith (California, University, Davis, CA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-59, S-60 7 refs Grant No AF-AFOSR-77-3430

**A82-40673 \* # Dynamics of weight loss during prolonged spaceflight.** C S Leach (NASA, Johnson Space Center, Houston, TX), J I Leonard (General Electric Co., Houston, TX), and P C Rambaut (NASA, Washington, DC) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-61, S-62 6 refs

Data from three Skylab flights lasting 28, 59, and 84 days are used to study changes in body composition occurring during extended spaceflight. The analysis includes pre- and postflight measurements used to compute lean body mass and body fat losses for an entire mission using previously accepted methods based on total body water, potassium, and density, and also includes the daily metabolic

balances in order to provide an estimate of the time course of the changes in water, protein, and fat. The analytical approach is explained and the results presented, including a summary of changes in lean body mass and changes in weight loss and tissue components. It is concluded that little more than half of the weight loss observed during the missions can be attributed to loss in lean body mass, the remainder being derived from fat stores C D

**A82-40674 \* # Otoconial complexes as ion reservoirs in endolymph.** M D Ross and T J Williams (Michigan, University, Ann Arbor, MI) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-63, S-64 5 refs Grant No NSG-9047

Scintillation spectrometry was employed to examine the Ca-45(2+) uptake and exchange by otoconial complexes in the sensory region endolymph medium, and a comparison was made with bone mineral deposition. CaCl<sub>2</sub> was injected intraperitoneally into 22 rats and blood samples were collected at set intervals during the subsequent 15 min-lm life durations of the animals. The animals were eventually sacrificed and saccular and utricle otoconial complexes were microdissected while bone chips from the otic bone and femur were gathered by scraping. Ca-45 was present in the saccular otoconial complexes within 15 min of injection, an uptake similar to the bone deposition, while slower rates were observed with the utricle complexes. Utricle uptake, however, accelerated 5-6 hr postinjection, and total otoconial content was always lower than proportional bone absorption M S K

**A82-40675 # Effect of baroreceptor denervation on +G sub z tolerance in dogs.** D F Peterson (Oral Roberts University, Tulsa, OK) and V S Bishop (Texas, University, San Antonio, TX) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-65, S-66 Grant No AF-AFOSR-73-2525

**A82-40676 # The effects of +G2 acceleration stress on right ventricular pressures in conscious miniature swine.** M H Laughlin and J E Whinnery (USAF, School of Aerospace Medicine, Brooks AFB, TX) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-67, S-68

The effects of various levels of g-stress due to acceleration were examined on five young female miniature swine. Physiological parameters were monitored by means of catheters inserted in the cranial vena cava and outfitted with pressure transducers which were moved into the right ventricular chamber when the animals were placed in a centrifuge. Sample pressures were taken during rest, and during and after 30 sec exposures to 1-9 g integer increments of stress. Increases were observed in mean right ventricular systolic pressure, torr/sec, and heart during acceleration. The highest mean right ventricular diastolic pressure increase occurred at 5 g, while the pressure peaked at 3 g. It is concluded that acceleration induced a reflex increase in sympathetic tone to the heart, affected the mechanical processes of the lungs, and increased pulmonary vascular resistance M S K

**A82-40677 \* # Effect of simulated weightlessness on energy metabolism in the rat.** J P Jordan, H A Sykes, J C Crownover, C L Schatte, J B Simmons, II, and D P Jordan (Colorado State University, Fort Collins, CO) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-69, S-70 Grant No NSG-2232

Results of measurements of food uptake and body weight changes occurring in rats suspended from a harness so that the antigravity muscles were not used for locomotion are presented. The rats were tested in pairs, with both in a harness but only one suspended off its hind legs, this section lasted 7 days. A second phase of the experiment involved feeding the nonsuspended rat the same amount of food the experimental rat had consumed the previous day. All rats experienced decreased in body weight and food intake in the first stage, while in the second stage the suspended rat lost more weight. The total oxygen uptake, CO<sub>2</sub> output, and rate of C-14O<sub>2</sub> production were depressed in the suspended rats, then returned to normal levels once the rats were back on thygroud. It is concluded that the gross metabolic processes are unaffected by simulated weightlessness M S K

**A82-40678 # Gravity, metabolic rate and body size of mammals.** A C Economos (San Jose State University, San Jose, CA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-71, S-72 10 refs

The discrepancy of mammalian basal metabolic rate allometry from the theoretically plausible 'surface law' is studied from the perspective of response to experimentally induced hypergravity. Gravitational tolerance, 'rate' of repression of growth, and basal metabolic rate as a function of body mass are determined for a variety of animals. It is shown that gravitational tolerance obeys a power law, which is also found for repression of growth in hypergravity C D

**A82-40679 \* # Altered bone turnover during spaceflight.** R T Turner, E R Morey, C Liu, and D J Baylink (U S Veterans Administration Medical Center, Tacoma, WA, NASA, Ames Research Center, Moffett Field, CA) *Physiologist, Supplement*, vol 22, Dec 1979 (1982), p S-73, S-74 5 refs

Modifications in calcium metabolism during spaceflight were studied, using

parameters that reflect bone turnover. Bone formation rate, medullary area, bone length, bone density, pore size distribution, and differential bone cell number were evaluated in growing rats both immediately after and 25 days after orbital spaceflights aboard the Soviet biological satellites Cosmos 782 and 936. The primary effect of space flight on bone turnover was a reversible inhibition of bone formation at the periosteal surface. A simultaneous increase in the length of the periosteal arrest line suggests that bone formation ceased along corresponding portions of that surface. Possible reasons include increased secretion of glucocorticoids and mechanical unloading of the skeleton due to near-weightlessness, while starvation and immobilization are excluded as causes. C D

**A82-40680 \* # Effect of space flight on bone strength.** D. M. Spengler, E. R. Morey, D. R. Carter, R. T. Turner, and D. J. Baylink (NASA, Ames Research Center, Moffett Field, CA, U.S. Veterans Administration Medical Center, Tacoma, WA) *Physiologist, Supplement*, vol. 22, Dec 1979 (1982), p. S-75, S-76. 6 refs.

To test the possibility that spaceflight has a deleterious effect on bone mechanical properties, femur breaking strength by torsional loading in rats that had been flown for 19 days aboard Cosmos 936 was determined. The results showed that femurs from flight rats were less stiff than the flight controls, and failed under torsion at a lower torque and energy of absorption. The defect was corrected following space flight and could be prevented during space flight by centrifuging the rats at 1 x g. Altered bone geometry due to inhibition of bone formation at the periosteal surface provides the most likely explanation for the decrease in bone strength during spaceflight. C D

**A82-40681 # The effect of G sub z acceleration on pulmonary perfusion in the miniature swine.** J. E. Whinnery and M. H. Laughlin (USAF, School of Aerospace Medicine, Brooks AFB, TX) *Physiologist, Supplement*, vol. 22, Dec 1979 (1982), p. S-77, S-78.

**A82-40682 \* # Influences of horizontal hypokinesia on performance and circadian physiological rhythms in female humans.** C. M. Winget, C. W. DeRoshia, and H. Sandler (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, CA) *Physiologist, Supplement*, vol. 22, Dec 1979 (1982), p. S-79, S-80. 5 refs.

Eight females from 35-45 yr of age were subjected to seven days of ambulatory control, seven days of bed rest, and a five day recovery period, with 30 min of centrifugation on day seven of bedrest to determine the effects of weightlessness on the circadian rhythms of females in that age group. Heart rate and rectal temperature (RT) were monitored and each subject was tested in a flight simulator twice a day in conditions of varying levels of turbulence. The flight simulations were run during the morning and acrophase of the circadian RT and performance errors were monitored for 6 min. No significant differences were detected in the group performance data pre-, during, and post-bedrest, although better performance in the simulator was observed after the centrifuge exposure. An RT phase shift was statistically significant between pre- and during bedrest stages. M S K

**A82-40683 \* # Instantaneous stroke volume in man during lower body negative pressure /LBNP/.** J. A. Loeppky, K. L. Richards, E. R. Greene, M. W. Eldridge, D. E. Hoekenga, M. D. Venters, and U. C. Luft (Lovelace Foundation for Medical Education and Research, U.S. Veterans Administration Medical Center, Albuquerque, NM) *Physiologist, Supplement*, vol. 22, Dec 1979 (1982), p. S-81, S-82. 6 refs. Contract No. NAS9-15483.

Results of an examination of the instantaneous time course of the stroke volume (SV) and cardiac output (Q) in response to the onset and release of -50 torr lower body negative pressure (LBNP) are reported. Six male subjects were sealed into a LBNP box up to the iliac crest while being monitored by echocardiograph for centerline blood velocity, fluid displacement, stroke volume, heart rate, and leg volume. Particular use was made of pulsed ultrasonic Doppler velocity meters for measuring the blood velocities and flow dynamics. Measurements were made of the subjects continuously beginning from 20 sec prior to and one min after LBNP onset and release. A linear fall in the SV was observed with LBNP at 49% of the baseline value after 33 sec. A 62% drop, the lowest, was detected after 8 min of LBNP. The leg volume was inversely related to Q for the duration of the experiment. M S K

**A82-40684 # Ultra-high impact free-fall survival.** R. G. Snyder (Michigan, University, Ann Arbor, MI) *Physiologist, Supplement*, vol. 22, Dec 1979 (1982), p. S-83, S-84. 11 refs.

Results of a survey of recorded literature empirically defining the lethal limits of stopping time after free fall are reported. The studies covered impacts on a variety of surfaces, including water, snow, ice, concrete, etc. A decisive factor in the survival after impact following free-fall was determined to be the distribution of the force. Cleaving water by head-first or feet-first entrance was found to have prevented death after terminal speeds of 97 and 116 ft/sec. Cases are cited, however, of suicide attempts from jumping off five and six story buildings, where the individuals received only minor injuries, and actually were ambulatory after the impact. It is suggested that if the time duration of an abrupt impact decreases

below 600 microsec, levels of impact forces may be withstood which in other conditions would be lethal. M S K

**A82-40685 # Simulated gravitational field influences on the aging process.** A. Vrabiescu (National Institute of Gerontology and Geriatrics, Bucharest, Rumania) *Physiologist, Supplement*, vol. 22, Dec 1979 (1982), p. S-85, S-86. 7 refs.

Results of experiments on 97 rats to assay the influence of gravity on aging process are reported. Three groups experienced 1, 2, and 5 g's each for period of at least 473 days in a centrifugal device. Growth, skin condition, hair, nails, behavior, memory, O<sub>2</sub> consumption, body temperature, ECG, peripheral blood cytology, morbidity, and mortality were evaluated in all the animals, with 6-10 rats from parallel groups also undergoing autopsy for morphological examination of internal organs and the biological age of collagen. Rats exposed to higher accelerations experienced growth slowdown 30-90 days earlier than the normal gravity rats. Symptoms such as arthrosis, osteoporosis, and decalcification, all indicative of advanced age, were also present in the rats exposed to two and five g acceleration after several months. Accelerated collagen aging was evident in the rats enduring 5 g's, as were neuro-endocrine reactions suggestive of stress. M S K

**A82-40686 International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980, Proceedings.** *Physiologist, Supplement*, vol. 23, Dec 1980 (1982) 159 p.

The Proceedings of the Second Annual Meeting of the IUPS Commission on Gravitational Physiology are presented. Papers are presented on the effects of gravity and weightlessness on the physiology of humans and other animals, both during space flights and in simulation experiments. Topics discussed include the adaptation of animals to changed gravity, metabolic and morphological studies of physiological systems during conditions of changed gravity, the function and structure of the gravity-dependent systems, such as the vestibular, bone, and muscle systems, hypokinesia and immobilization, as well as various other aspects of gravitational physiology. N B

**A82-40687 # Aspects of cardiovascular adaptation to gravitational stresses.** F. Bonde-Petersen, N. J. Christensen, O. Hennksen, B. Nielsen, C. Nielsen, P. Norsk, L. B. Rowell, T. Sadamoto, G. Sjogaard, and K. Skagen (Copenhagen, University, Copenhagen, Denmark) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol. 23, Dec 1980 (1982), p. S-7 to S-10. 10 refs. Research supported by the Danish Space Council, and Statens Laegevidenskabelige Forskningsrad.

Conditions of gravitational stress were studied in humans during exercise, both dynamic and static. The subjects were exposed to high and low gravity conditions, simulated by a variety of methods, including lower body negative and positive pressures, bed rest, and water immersion. Dynamic exercise tests were conducted on bicycle ergometers. Various parameters were measured, including cardiac output (CO), mean arterial blood pressure, heart rate, and skin blood flow. Blood samples were analyzed for proteins, hemoglobin, colloid osmotic pressure, etc. Among other results, it was found that plasma volume decreases during studies lasting six hours. The adaptation of CO, which first was increased by up to 60%, was more rapid as CO was gradually recovering during the first two hr. However, the decrease in forearm vascular resistance, which was observed immediately at the onset of head-out water immersion, persisted during the experiment. During exercise, static and dynamic water immersion to the xiphoid level produced greater changes than during the control situation. In addition, local hydrostatic forces elicit vascular reflexes, which can be dominated by the general sympathetic nervous activity evoked during lower body negative pressure. N B

**A82-40688 # Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites.** O. G. Gazenko, A. M. Genn, E. A. Il'in, V. S. Oganov, and L. V. Serova (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol. 23, Dec 1980 (1982), p. S-11 to S-15. 47 refs.

Results of experiments on mammals aboard several Cosmos biological satellites are reviewed. These experiments were conducted to investigate the patterns of adaptation of higher animals to weightlessness, to study the physiological and morphochemical characteristics of organs and tissues of weightless animals, and to explore their readaptation to earth's gravity after exposure to zero-g. Results of these biosatellite experiments demonstrated certain patterns of adaptation of animals to weightlessness. For example, a relatively prolonged exposure to weightlessness did not cause pathological changes in the structure of any of the organs tested. The changes observed in the hypothalamus-hypophysis-adrenal system, muscles, bones, myocardium, and other organs proved reversible, returning to normal by 25 days after the flights. Certain experiments suggest that the space flight-induced stress reaction remains at a moderate level throughout the flight. Among other results, the studies provided information about structural

and metabolic changes in muscles and bones, which were found to be similar to the changes seen in ground-based simulation experiments (hypokinesia and hypodynamia) NB

**A82-40689 # Physiological mechanisms of adaptation of rat skeletal muscles to weightlessness and similar functional requirements.** V S Oganov, S A Skuratova, A N Potapov, and M A Shirvinskaya (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-16 to S-21 34 refs

Investigations of the mechanisms of functional atrophy in skeletal muscles, such as muscle mass loss, and the decline of muscle tone, strength, and endurance, which occurs during long periods of weightlessness were conducted on rats aboard Cosmos biosatellites and in ground-based simulated weightlessness studies. It was observed that the soleus and extensor digitorum longus muscles showed a decrease of muscle contraction strength upon their tetanic stimulation, loss of elasticity, and a decline of tolerance to fatigue. In addition, the soleus muscle displayed a selective acceleration of tetanus development and a decrease of the amplitude of the twitch/tetanic tension ratio. A decrease in the maximum amplitude of isometric tension (Pm) was observed in the slow soleus muscle and, to a lesser extent, in the medial head of the triceps brachii muscle. Hypokinetic experiments did not reveal significant changes of Pm in glycennated fibers of any fore- or hind-limb muscle tested. Hypodynamic studies demonstrated a decrease in strength and a shortening of the time of tetanus development in the intact medial head of the triceps brachii muscle NB

**A82-40690 # Weightlessness effects on resistance and reactivity of animals.** L V Serova (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-22 to S-26 10 refs

Studies of bodily resistance and reactivity in rats during weightless conditions were conducted aboard several Cosmos biosatellites during flights lasting 18-22 days (approximately 1/50 of the lifespan of the animals). It was observed that both catabolic and anabolic processes were activated, the thymus and spleen weights decreased, and the thymocyte and splenocyte counts were reduced. In addition, the animals exhibited lymphopenia in the blood and a decrease in the percentage content of lymphocytes in the bone marrow. Stress tests showed that the animals exposed to weightless conditions largely retained their ability for adequate reactions of blood cells to additional stressors, in spite of the fact that the initial (postflight-pretest) blood of flight animals differed significantly from that of control animals. It is concluded that an 18-22 day exposure to weightlessness reduces resistance of the animal body, although this reduction is not great and exerts no significant effect on animal viability NB

**A82-40691 # Artificial gravity in space flight.** A R Kotovskaia, E A Il'in, V I Korolkov, and A A Shipov (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-27 to S-29 5 refs

The biomedical effects of artificial gravity generated by spacecraft rotation on rats was investigated during a 19.5 day space flight, and compared to the effects caused by weightlessness. An artificial gravity of 1 g generated inflight helped to prevent to a large degree the development of weightlessness-induced adverse changes in the animals. Artificial gravity normalized the effects of weightlessness on the functions of the myocardium, skeletal muscle system, and the excretory system. However, specific effects caused by the rotation were also observed, including functions realized through the combined action of the optic, vestibular, and motor sensors (equilibrium function, turning reflex, orientation in a maze, higher motor control) NB

**A82-40692 # Biorhythms of rats during and after space flight.** V Ia Klimovitski, E A Il'in, V S Oganov, G G Shlyk, V V Verigo (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR), K Hecht, M Poppe, T Schlegel, E Wachtel, and D Zass (Berlin, Humboldt Universität, Berlin, East Germany) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-30 to S-33 9 refs

The influence of weightlessness, confinement, and the remoteness of natural terrestrial time cues on biorhythms in rats was investigated both during and after space flights on Cosmos satellites. Results showed that weightlessness did not exert an adverse effect on the formation and stability of circadian rhythms of rats in-flight. The rate with which the phase of the circadian rhythm of motor activity and body temperature drifted after a day-night inversion was normal. It was suggested that weightlessness, being an additional stressor that was absent in the synchronous animals, somehow helped to accentuate circadian rhythmicity. After flight and synchronous experiments, the circadian and minute rhythms changed in both animal groups, although these experiments were completed during the phase drift which continued after day-night inversion. However, the

physiological loads associated with the adaptation to weightlessness and readaptation to 1 g upon return to earth of flight animals were responsible for more stable changes in their biorhythms than for synchronous rats NB

**A82-40693 # Rhythms of electrolytes and hydroxyproline excretion in urine of rats after three weeks of weightlessness - Biosatellite Cosmos-1129.** K Kwarecki, H Debiec, and Z Koter (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-34 to S-37 14 refs

Investigations were carried out on rats subjected to a 180 deg light-dark phase shift within 10 days of spaceflight. On the third, eighth and thirteenth day after landing the following rhythms were determined: urine volume, excretion of sodium, potassium, calcium, phosphate and hydroxyproline with urine. All rhythms studied in the urine in control groups were synchronized within 13 days after being subjected to the inverted lighting schedule. In postflight animals the circadian rhythms of diuresis, sodium and potassium excretion with urine were synchronized to the new lighting regimen whereas the other variables were not phase-shifted even within 23 days period. The results suggest that the synchronizing effect of the light-dark cycle under space conditions was weakened (Author)

**A82-40694 # Ultrastructural qualitative and quantitative evaluation of cytoplasmic structures of heart muscle of rats living aboard biosatellite Cosmos 936.** S Baranski, M Kujawa, and A Kaplanski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland, Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-38 to S-40 8 refs

Ultrastructural morphometrical examinations of some cytoplasmic structures from heart muscle of rats flight on board of the biosatellite Cosmos 936 were carried out. Two groups of animals were examined, one living in weightlessness conditions and the second in weightlessness with artificial, centrifuge-induced gravity. In both groups of animals the following was observed: changes in the structure of mitochondrial and smooth endoplasmic reticulum and myofibrils. Artificial gravity does not prevent changes in rat heart muscle (Author)

**A82-40695 # Body composition of rats flown aboard Cosmos-1129.** A S Ushakov, T A Smirnova (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR), G C Pitts (Virginia, University, Charlottesville, VA), N Pace, A H Smith, and D F Rahlmann (California, University, Berkeley and Davis, CA) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-41 to S-44 9 refs  
(Previously announced in STAR as N82-20832)

**A82-40696 # Stress in space flight - Metabolic aspects.** R A Tigranian, L Macho, R Kvetnansky, S Nemeth, and N F Kalita (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR), Slovenska Akademia Vied, Ustav Experimentalnej Endokrinologie, Bratislava, Czechoslovakia) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-45 to S-50 25 refs

In order to identify the stress reaction associated with a prolonged exposure to weightlessness, various stress indicators (such as the concentration of catecholamines, the activities of enzymes involved in adrenal, hypothalamus, myocardium, and blood metabolism, the hormone content in blood, and the enzyme activity in the liver) were investigated in different organs and tissues of rats flown for 18.5 days aboard a Cosmos biosatellite. The results obtained were compared to data from rats exposed to the effects of artificial gravity generated by a centrifuge on the biosatellite, as well as from vivarium controls. It was concluded that the space flight was not a powerful stressor for the sympatho-adrenal system. An increase in the activities of aspartate aminotransferase, alanine aminotransferase, fructose-1,6-diphosphatase, and glucose-6-phosphatase was the only convincing evidence of weightlessness-induced chronic stress to which the rats were exposed throughout the flight. Thus, this study demonstrated a good adaptation of animals to prolonged weightlessness alone and to space flight effects on the whole NB

**A82-40697 # Results of morphological investigations aboard biosatellite Cosmos.** A S Kaplanski, E A Savina, V V Portugalov, E I Il'ina-Kakueva, E I Alekseev, G N Durnova, A S Pankova, G I Plakhuta-Plakutina, V N Shvets, and V I Yakovleva (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-51 to S-54 20 refs

A review is presented of morphological studies, conducted on Cosmos biosatellites, designed to identify the systems and organs showing reactions to weightlessness and to determine the pattern, specificity, and reversibility of changes induced. Results of these studies show that the direct effect of weightlessness

causes inhibition of bone growth, resorption and demineralization of bone tissues, functional atrophy of muscles, depletion of a portion of the capillaries in muscles, inhibition of erythropoiesis and thrombocytopoiesis, and the appearance of morphological signs of a decreased functioning of certain components of the neuro-endocrine system. A stress reaction during weightlessness results in the involution of lymphoid organs. It is concluded that all morphological effects of weightlessness are directly or indirectly associated with a diminished functioning of different organs and systems, and reflect the adaptation of the animal body to a new environment. N B

**A82-40698 \* # Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129.** S. Abraham, C. Y. Lin (Children's Hospital Medical Center, Oakland, CA), H. P. Klein, C. Volkman (NASA, Ames Research Center, Moffett Field, CA), R. A. Tigranian, and E. G. Vetrova (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-55 to S-58. 6 refs. (Previously announced in STAR as N81-32631)

**A82-40699 # Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat.** N. N. Demin, O. G. Gazenko, and R. A. Tigranian (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-59 to S-62.

The effect of relatively long periods of weightlessness on the metabolism of the central nervous system was studied in rats aboard several Cosmos biosatellites. Results showed that during stable adaptation to space flight conditions, cerebral metabolism was slightly inhibited, as expressed in the brain segments associated with motor activity. The decline in the absolute content of RNA and the normal content of proteins in Purkinje cells suggested that the level of protein metabolism in these neurons was lowered. This was also indicated by a decrease in the activities of acetylcholinesterase and cholinesterase. In the motor lobe, the content of thiol groups as well as cholinesterase activity decreased, perhaps reflecting an inhibition of central structures. In general, the changes identified are suggestive of a passive suppression of the functional activity of the brain, rather than manifestations of stress reactions. N B

**A82-40700 # Effect of spaceflight on lymphocyte stimulation.** A. Cogoli and A. Tschopp (Zürich, Eidgenössische Technische Hochschule, Zürich, Switzerland) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-63 to S-66. 14 refs. Swiss National Science Foundation Grant No. 3,499,0,79.

A review is presented of experiments on human lymphocytes performed either during space flights or at high-g and simulated low-g conditions in order to test the efficiency of the specific immune system during and after space flight. Results show that low-g conditions depress the activity of lymphocytes, whereas high-g conditions have a stimulating effect. Although no mechanism of activation is proposed, a number of effects are possible, including changes in the distribution of organelles induced by gravity or weightlessness which change the concentration of molecules involved in lymphocyte activation. In addition, the observed effect of gravity on the rate of lymphocyte activation suggests that a not-yet-identified biological clock in lymphocytes could be regulated by gravity. N B

**A82-40701 # Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment.** T. Szilagy, A. Szoor, O. Takacs, M. Rapcsak, V. S. Oganov, S. A. Skuratova, S. S. Oganessian, L. M. Murashko, and M. A. Eloian (Debreceni Orvostudományi Egyetem, Debrecen, Szegedi Orvostudományi Egyetem, Szeged, Hungary, Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR, Institute of Cardiology, Yerevan, Armenian SSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-67 to S-70. 14 refs.

The influence of weightlessness on the soleus, extensor digitorum longus, triceps, and brachial muscles was investigated in rats flown for 18.5 days aboard a Cosmos biosatellite. Results suggest that the changes in the muscles due to weightlessness depend on the functional properties of the muscles, although all of the muscles studied showed a great decrease in weight and contractile properties. The most sensitive reaction was displayed by the soleus muscle, which predominantly consists of slow fibers. Gel electrophoresis studies revealed an increase in the quantity of LC-3 fast myosin subunits in the soleus and extensor digitorum muscles, indicating that a transformation of the muscles takes place under conditions of weightlessness. Recovery experiments demonstrated that the soleus and brachial muscles showed significant change on the sixth day, whereas on the 29th day readaptation was complete. In addition, plaster cast immobilization studies were found to serve as a good model for the simulation of the effects of weightlessness. N B

**A82-40702 # Variability of physiological properties of rat skeletal muscles at different gravity levels.** V. S. Oganov, A. N. Potapov, S. A. Skuratova, and M. A. Shirvinskaya (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-71 to S-75. 26 refs.

Changes in the physiological parameters of skeletal muscles of rats exposed to weightlessness and to artificial gravity both in terrestrial and space flight conditions were investigated. Hindlimb muscles exhibited a significant decrease of maximal amplitude of isometric tension, especially in the soleus muscle, in the absence of significant changes in the contraction strength of the extensor digitorum longus muscle. Studies of the forelimb muscles suggested that the final result of weightlessness on the triceps muscle is very similar to the reaction of the antigravity soleus muscle. The response of the brachial muscle to space flight includes a more marked 'training' effect, which is manifested as an increased maximal amplitude of isometric tension. These experimental findings give evidence that the reactions of the contraction system of different muscle due to an altered gravity are strongly dependent on their functional specialization and the biomechanics of their contraction. N B

**A82-40703 \* # Morphometric analysis of rat muscle fibers following space flight and hypogravity.** L. A. Chui (Southern California, University, Los Angeles, CA) and K. R. Castleman (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-76 to S-78. 10 refs. NASA-supported research.

The effect of hypogravity on striate muscles, containing both fast twitch glycolytic and slow twitch oxidative fibers, was studied in rats aboard two Cosmos biosatellites. Results of a computer-assisted image analysis of extensor digitorum muscles from five rats, exposed to 18.5 days of hypogravity and processed for the alkaline ATPase reaction, showed a reduction of the mean fiber diameter (41.32 ± 0.55 microns), compared to synchronous (46.32 ± 0.55 microns) and vivarium (49 ± 0.5 microns) controls. A further experiment studied the ratio of fast to slow twitch fibers in 25 rats exposed to 18.5 days of hypogravity and analyzed at four different periods of recovery following the space flight. Using the previous techniques, the gastrocnemius muscle showed a reduction of the total muscle fiber area in square microns and a reduction in the percentage of slow fibers of flight animals compared to the control animals. N B

**A82-40704 \* # Bone resorption and calcium absorption in rats during spaceflight.** C. E. Cann, R. R. Adachi, and E. Morey Holton (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, California, University, San Francisco, CA) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-83 to S-86. 7 refs. (Previously announced in STAR as N81-32845)

**A82-40705 # Bone growth in the rat mandible during space flight.** D. J. Simmons, J. E. Russell, F. Winter, W. Walker (Washington University, St. Louis, MO), A. Vignery, Mr. Tran Van Thuc (Yale University, New Haven, CT), G. D. Rosenberg (Indiana University, Purdue University, Indianapolis, IN), and R. Baron (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-87 to S-90. 8 refs. (Previously announced in STAR as N81-32839)

**A82-40706 \* # A new rat model for studies of hypokinesia and antiorthostasis.** X. J. Musacchia and D. R. Deavers (Louisville, University, Louisville, KY) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-91, S-92. 12 refs. Grants No. NSG-2191, No. NSG-2325.

A new rat model (suspension and immobilization) is described for induction of hypokinesia and orthostatic manipulations. Hypokinetic responses were comparable to those in prolonged bed rest and weightlessness in humans, body or limb casted and small cage restrained animals. Responses to antiorthostasis (15 to 20 deg head down tilt) in rats were similar to those in neutral buoyancy tests in humans and animals and to those in prolonged bed rest in humans. During seven days of hypokinesia there was an atrophy of the gastrocnemius and increased excretion of urinary nitrogenous end products. The antiorthostatic (AOH) 15 to 20 deg head down tilt resulted in diuresis, natriuresis and kaliuresis. No comparable responses were observed in orthostatic hypokinetic (OH) rats. Readaptation from AOH and OH occurred during one week recovery in metabolic cage conditions. (Author)

**A82-40707 # Na<sup>+</sup>/K<sup>+</sup> dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats.** P. Groza, S. Cananau, D. Ungureanu, A. Petrescu, and C. T. Dragomir (Academia de Stiinte Medicale, Bucharest, Rumania) (*International Union of Physiological Sciences, Annual*



Meeting, 2nd, Budapest, Hungary, July 13-19, 1980) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-93, S-94 8 refs

Membrane ionic transfer in skeletal and cardiac muscles was studied in rats exposed to 15, 30, and 60 days of hypokinesia by determining the Na(+)-K(+) dependent ATPase membrane activity. Electron microscopy showed that both types of muscles were modified after hypokinesia, and mitochondrial alteration and atrophy of the myofibrils were also observed. The changes in the myocardium were more marked, due to a decreased metabolic rate based on a diminished oxygen need and use and a functional deficiency Na(+)-K(+) dependent ATPase activity diminished with a lengthening of the time of hypokinesia. In the myocardium, the decrease in the activity of this enzyme was more pronounced, as well as more rapid, than in the soleus muscle, thus demonstrating a greater functional lability of this muscle. The intracellular content of Na(+) increased, while that of K(+) decreased, which can be explained as the consequence of structural modifications and alterations of the complex ATPase membrane system which ensures the Na(+) and K(+) extracellular and intracellular distribution and polarization. N B

**A82-40708 # Effect of immobilization on the ATPase activities and Ca-uptake of sarcoplasmic reticulum in different types of muscles.** G Jakab, L Gajdos, and F Guba (Szegedi Orvostudományi Egyetem, Szeged, Hungary) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-95, S-96 7 refs

The effect of immobilization on the activity of ATPase calcium ion uptake is studied in sarcoplasmic reticulum vesicles isolated from rabbit gastrocnemius and soleus muscles. The changes in the 'extra' Ca(2+) ATPase activity of normal and immobilized muscles are examined in order to study the Ca transport system. Results show that the 'extra' Ca(2+) ATPase activity increases about two-fold in the gastrocnemius muscle and about five-fold in the soleus muscle in comparison with the controls after two weeks of immobilization. The calcium ion uptake capacity values in both types of muscles are the highest after two weeks of immobilization, increasing three-fold in the gastrocnemius muscle and four-fold in the soleus muscle. It is concluded that immobilization has a strong effect on the calcium metabolism of the fibers, in which the muscles adapt to new situations by establishing a new steady state. N B

**A82-40709 # Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness.** M G Meszaros, O Takacs, J Hideg, E Berenyi, and F Guba (Szegedi Orvostudományi Egyetem, Szeged, Hungarian People's Army, Medical Corps, Hungary) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-97, S-98

Plaster cast immobilization seems to be an adequate method for simulating the effect of weightlessness on muscles under terrestrial conditions. Therefore, the protein composition of myofibrils from fast and slow muscles of rabbit hind limbs immobilized by plaster cast was analyzed using one- and two-dimensional gel-electrophoretic techniques. It was demonstrated that the response of structural elements from functionally different muscles on the altered demands manifests itself in a fading of isomyosin pattern characteristic of fast and/or slow contractile properties. In the fast muscle the quantity of homodimeric LC-3 isomyosin decreases, while increases in the slow one. This results in a transformation of the myosin population, consequently a de-differentiation of muscle cells. The changes will be discussed in the term of plasticity of vertebrate striated muscles. (Author)

**A82-40710 # Effect of immobilization of the excitatory parameters of different type skeletal muscle.** A Torok, I Sziklai, O Takacs, and F Guba (Szegedi Orvostudományi Egyetem, Szeged, Hungary) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-99, S-100

The effect of immobilization on the physiological functions of rabbit skeletal muscles is investigated. Results indicate that the latency time, which may be regarded as one of the excitation parameters, increases in immobilized muscles, and may be related to the effect of disuse. The twitching amplitude of the gastrocnemius muscle does not change with disuse, while it decreases by about 50% in the soleus muscle, and these values are found to be parallel to the decrease of myofibrillar protein content. More importantly, it is determined that the half-time of tension development and the half-time of relaxation for the soleus muscle are equivalent to the values found for the gastrocnemius muscle as a result of disuse. It is concluded that disuse leads to the dedifferentiation of muscles with different functions. N B

**A82-40711 # Effect of immobilization on the nonhistone protein composition in different types of skeletal muscles.** I Sziklai, O Takacs, Z Kiss, and F Guba (Szegedi Orvostudományi Egyetem, Szeged, Hungary) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-101, S-102

Nonhistone proteins of fast-twitch glycolytic head of the gastrocnemius muscle and slow-twitch oxydative soleus muscle of rabbit were extracted and analyzed

by two-dimensional gel electrophoresis in normal stages and after two weeks of disuse. The ratio of the quantities of nonhistone chromosomal proteins to DNA was nearly standard in soleus muscle 1.21 (normal), 1.29 (disused), and decreased in gastrocnemius muscle 2.66 (normal), 2.26 (disused). After disuse, besides the basically unchanged nonhistone patterns, there was a disappearance of the low mol weight spots in the soleus muscle while new polypeptides emerged in the same range in the gastrocnemius muscle. (Author)

**A82-40712 # Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles.** I Edes, I Sohar, H Mazarean, O Takacs, and F Guba (Szegedi Orvostudományi Egyetem, Szeged, Hungary) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-103, S-104

The effect of different periods of immobilization (1-6 weeks) on the aerobic and anaerobic metabolism of rabbit soleus and gastrocnemius muscles is studied by measuring the total activity of lactic dehydrogenase (LDH), malic dehydrogenase (MDH), aldolase (ALD), isocitrate dehydrogenase (ICDH), as well as the distribution of LDH isoenzymes. In the soleus muscle, the activity of the enzymes taking part in the oxidative metabolism (ICDH, MDH) decreases more rapidly than the rate of the glycolytic enzyme activities (LDH, ALD), while in the gastrocnemius muscle the rate of decrease in the activity of these enzyme pairs is reversed. For both types of muscles, increasing periods of immobilization lead to increasing amounts of LDH isoenzymes containing M subunits, which are characteristic for anaerobic metabolism. N B

**A82-40713 # The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats.** E Dux, F Joo (Magyar Tudományos Akadémia, Biofizikai Intézet és Biológiai Központ, Szeged, Hungary), L Dux, A Gecse, A Ottléc, Zs Mezei, G Telegdy (Szegedi Orvostudományi Egyetem, Szeged, Hungary), L Bognar, P Remes, and J Hideg (Hungarian People's Army, Medical Corps, Hungary) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-105 to S-107 10 refs

The effect of intermittent hypoxic and hypobaric environments on the ultrastructure of the blood-brain barrier in rats is studied, and the ability of the isolated brain capillaries of the pups from the previously exposed rats, as well as adult male rats, to synthesize prostacyclin and prostaglandin (PG) is determined. Results show that in pregnant rats, hypoxic exercises enhance the transport processes through the endothelial cells, as shown by an increased number of pinocytotic vesicles and a contraction of the nuclei of endothelial cells. Progesterone treatment prevents these alterations, and also normalizes the changes in the PGF 2 and PGE 2 synthesizing ability of the pups of hypoxic exercised rats. In adult male rats, no ultrastructural changes and milder alterations of PG synthesis are found. N B

**A82-40714 # Relations between respiratory and circulatory control during gravitational load in man.** S Waurick (Leipzig, Universität, Leipzig, East Germany) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-108 to S-110 11 refs

The respiratory CO<sub>2</sub>-responses (0, 2, 4% CO<sub>2</sub> in air) of five healthy males were investigated in a horizontal (0 deg), a 30 and 70 deg upright position. The response curves were shifted to the left, depending on the gravitational load. As the cardiac output diminishes under these conditions it is concluded that the influence of circulatory control on respiratory regulation is not based on the magnitude of bloodflow. The ratio of relative change in heart rate and respiratory minute-volume was 1.235 compared to 1.3 or 1.4 during workload. Furthermore increasing CO<sub>2</sub>-concentrations provoked chronotropic effects, with their direction and extent depending on the initial state. Going from horizontal to vertical positions the changes in the inclinations of CO<sub>2</sub> heart rate and CO<sub>2</sub> respiratory response curves were always correlated. (Author)

**A82-40715 # The effects of human growth hormone administration on the functional status of rat atrophied muscle following immobilization.** M Apostolakis, A Deligiannis, and A Madena-Pyrgaki (Salonika, University, Salonika, Greece) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-111, S-112 6 refs

In 40 adult rats the right hind limb was immobilized by insertion of a metal pin. Fifteen days later the pin was removed and the animals divided into two equal groups: group A-untreated and group B-treated by 0.06 IU hGH daily. After two weeks the following parameters of both gastrocnemius muscles in all the animals were obtained: total EMG activity, contractile properties and work capacity. From the results it can be concluded that hGH administration (1) increased the EMG activity of atrophied muscle in group B by 73%, (2) increased the isometric tension of the same muscles by 58% and 65% (twitch and tetanic tension respectively), and (3) restored to a great extent (by 44%) the work capacity of the atrophied muscles in group B as compared to the atrophied muscles of group A. (Author)

**A82-40716 \* # Gravitational adaptation of animals.** A H Smith (California, University, Davis, CA) and R R Burton (USAF, School of Aerospace Medicine, Brooks AFB, TX) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-113, S-114 9 refs Grant No NGR-05-004-008

The effect of gravitational adaptation is studied in a group of five Leghorn cocks which had become physiologically adapted to 2 G after 162 days of centrifugation. After this period of adaptation, they are periodically exposed to a 2 G field, accompanied by five previously unexposed hatch-mates, and the degree of retained acceleration adaptation is estimated from the decrease in lymphocyte frequency after 24 hr at 2 G. Results show that the previously adapted birds exhibit an 84% greater lymphopenia than the unexposed birds, and that the lymphocyte frequency does not decrease to a level below that found at the end of 162 days at 2 G. In addition, the capacity for adaptation to chronic acceleration is found to be highly heritable. An acceleration tolerant strain of birds shows lesser mortality during chronic acceleration, particularly in intermediate fields, although the result of acceleration selection is largely quantitative (a greater number of survivors) rather than qualitative (behavioral or physiological changes) NB

**A82-40717 # Some of biochemical parameters in rat brain during +Gz acceleration.** H Debiec, W Kowalski, S Wroblewski, and K Kwarecki (Wojakowski Instytut Medycyny Lotniczej, Warsaw, Poland) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-117, S-118 7 refs

Stability of lysosomes and mitochondria were tested to determine the influence of acceleration on brain injuries. The degree of enzymatic adaptation to hypoxic conditions was also evaluated. After 1 hr of +5Gz acceleration, cytoplasmic activity of intralysosomal and intramitochondrial enzymes increased, which indicates damage of these cell structures. An increase in isoenzyme LDH5 activity suggests a change of cell metabolism to anaerobic (Author)

**A82-40718 \* # Alterations in heat loss and heat production mechanisms in rat exposed to hypergravic fields.** J M Horowitz, B A Horowitz, and J Oyama (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, California, University, Davis, CA) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-119, S-120 7 refs Grant No NSG-2234

A review of studies investigating the thermal response of rats exposed to hypergravic fields well below maximum tolerance levels is presented. It is concluded that several lines of evidence indicate that the neural switching network for temperature regulation and cardiovascular channeling of blood flow is transiently affected during the first hour a rat is exposed to hypergravity. Moreover, even after one hour of exposure, when the core temperature has fallen several degrees, shivering and nonshivering thermogenesis are not fully activated. Only after prolonged exposure to hypergravic fields do heat production mechanisms recover sufficiently to bring the core temperature back to a normal level. Thus, the data indicate a more rapid recovery of effector mechanisms for heat loss than for heat production NB

**A82-40719 \* # Chronic central vascular expansion induces hypokalemia in conscious primates.** M C Moore-Ede and D A Kass (Harvard University, Boston, MA) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-123, S-124 5 refs Grant No NSG-9054

Central vascular expansion maintained for four days in conscious squirrel monkeys reconciles the apparently conflicting short-term fluid and electrolyte responses to water immersion and atrial balloon distension, with those described for prolonged weightlessness during space flight. The monkeys are subjected to an increased lower body positive air pressure (LBPP) of 20 torr which produces a 3 cm water increase in the central venous pressure. Results show a marked increase in the urinary excretion of sodium, potassium, and water during the first six hours of LBPP, and the diuresis is maintained throughout the period of LBPP, although the levels of sodium and potassium excretion decline after 24 hours of exposure. Plasma aldosterone transiently drops within the first three hours of LBPP, and then regains normal levels within 24 hours, after which time these levels are maintained despite the continued LBPP stimulus. It is suggested that the normal plasma aldosterone levels observed in the experiments, as well as during space flight, might, represent a relative hyposecretion in terms of volume homeostasis and a relative hypersecretion with respect to plasma potassium regulation. Thus, kaliuresis and marked natriuresis is confined primarily to the first 24 hours of central volume expansion, a period for which comparable data from space flights are lacking NB

**A82-40720 # Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration.** H Urano, Y Mizuno, S Watanabe (Gifu University, Gifu, Japan), and G Mitarai (Nagoya University, Nagoya, Japan) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July*

*13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-125, S-126 6 refs

The effects of acceleration produced by centrifugal force upon cardiopulmonary and somatosensory system were investigated using 23 adult rabbits. The experiments were included to compare with intact and labyrinthectomized animals, and also with awake and light anesthetized ones. The centrifugal force (G) was applied up to 5 G making a load paradigm of staircase-type or trapezoid-type, in which each plateau level of G continued over 45 sec. The respiratory rate and heart rate were not in proportion to magnitude of acceleration. Responses by the staircase acceleration drew a hysteresis loop and it seems that the responses of respiratory and heart rates produced by acceleration took either of those two values on the hysteresis curve. It was also observed in some cases that the nystagmus induced by acceleration was correlated inversely to EMG response of hind limbs (Author)

**A82-40721 # Labyrinth plugging as a model of suspended vestibular sensory input.** L Korzenszky and L Simon (Simmelweis Orvostudományi Egyetem, Budapest, Hungary) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-127, S-128

A simple, clearly reproducible experimental method is described for blocking the labyrinthine functions in mice, which can serve as a model for studying the vestibular adaptations to normal gravity and also can make it possible to differentiate the physiological states of animals during space flight. The vestibulum is filled with a sterile mixture of beeswax and paraffin which prevents movements of the endolymph in the semicircular ducts, as well as the deformation of otolithic receptor organs during accelerational or gravitational stimulation. Animals that have undergone the operation on one side show considerable asymmetry of postural tone, which is later exaggerated into a continuous rolling toward the plugged side. Mystagmography, biaxial stabilography, and the lift reaction are used to quantitatively evaluate the asymmetry in the postural and motor behavior, as well as to determine the time curve of adaptation NB

**A82-40722 # Space flight effects upon plasma and tissue lipids in rats.** I Ahlers, E Ahlersova, E Paulikova, I Datelinka, B Smajda, M Toropila, M Praslicka (Univerzita Pavla Jozefa Safarka, Kosice, Czechoslovakia), and R A Tigranian (Ministerstvo Zdravookhraneniya SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-131, S-132 6 refs

Plasma and tissue lipids were determined in rats flown in average 20 days aboard four (690, 782, 936, 1129) Cosmos biosatellites. Immediately after landing there was an increase in lipomobilization, in plasma lipids, in liver, thymus, and bone marrow triglycerides. The creation and use of artificial gravity (Cosmos 936) prevented the appearance of 'fatty liver', the increase of phospholipids in serum and the accumulation of triglycerides in bone marrow. The additional stress (repeated short-term immobilization) on days 1-6 postflight acted more profoundly on the space flight group, as compared with animals from terrestrial modelling experiments or with intact control ones. On day 25 postflight all changes disappeared but accumulation of bone marrow triglycerides persisted (Author)

**A82-40723 # Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats.** E Misurova, M Praslicka, K Kropacova, T Szabova (Univerzita Pavla Jozefa Safarka, Kosice, Czechoslovakia), and R A Tigranian (Ministerstvo Zdravookhraneniya SSSR, Institut Mediko-Biologicheskikh-Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-133, S-134 5 refs

The influence of space flight and artificial gravity on changes in the levels of deoxyribonucleoprotein (DNP) and nucleic acid is studied for the spleen and thymus of rats after approximately 20 days onboard three Cosmos satellites. Several hours after landing, partial DNP breakdown was found in the spleen and liver and the content of nucleic acids was reduced by about 60%. However, rats exposed to artificial gravity during the space flights show decreased DNP breakdown in the thymus, but not in the spleen. The changes in the DNP and nucleic acid levels evoked by the space flights recovered quickly after landing (within six days). Immobilization stress tests conducted 25 days after landing showed, on the other hand, a decrease in the DNA levels only in flight rats, but not in rats from model experiments or control groups NB

**A82-40724 # Initiation of nutation in sunflower hypocotyls.** A H Brown (Pennsylvania, University, Philadelphia, PA) and D K Chapman (University City Science Center, Philadelphia, PA) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-135, S-136 10 refs

A biophysical model for simulating the circumnutation of sunflower hypocotyls, developed by Johnsson (1968), is tested for validity by observing the initiation of nutation in these plants. The preferred experimental method consists of observations of clinostatted plants at rest and during the application of a 1 G centripetal force in the axial direction of the plants. The results obtained are not decisively

incompatible with Johnsson's model of circumnutation as a gravitropic hunting process. However, they are more easily reconciled with the less definitive concept of an endogenous oscillator which can initiate nutational motion when triggered by an axially imposed gravitational force without a significant prelude in the form of patently inductive wandering growth movements N B

**A82-40725 # Changes of periodic protoplasmic movements on the fast clinostat.** W Briegleb and A Schatz (Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugmedizin, Bonn, West Germany) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-137, S-138 7 refs

The effect of weightlessness on different physiological states of two organisms, the water plant *Elodea canadensis* and the slime mold *Physarum polycephalum*, is investigated. Small specimens of single cells of the test organisms are placed on a fast clinostat, and observed microscopically to detect changes of the periodic intracellular movements. The results are compatible with a general g-sensitivity of the cells and can be interpreted as an adaptation process of a rated value donor which cybernates the cell matrix. For *Physarum*, the speed of protoplasmic motion temporarily increases, and a long lasting induction of asymmetric half-period lengths, which may be more directly attributed to growth differentiation of the ectoplasm, is observed. In addition, the changes of period lengths, especially in *Elodea*, indicate correlations between endogenous clocks, especially those of circadian nature, and gravity N B

**A82-40726 # Skin temperature and thermal comfort in weightlessness.** L Novak (Universita J E Purkyne, Brno, Czechoslovakia), A M Genin (Ministerstvo Zdravookhraneniya SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR), and S Kozlowski (Polish Academy of Sciences, Laboratory of Applied Physiology, Warsaw, Poland) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-139, S-140 6 refs

The influence of weightlessness on the process of heat transfer between the human body and the outer environment during space flights is investigated. Results, obtained by an electrical dynamic katathermometer, show that skin temperatures during weightlessness differ markedly both at rest and after a work load has been applied from those under normal terrestrial conditions, including an increase in the skin temperature of the chest and a decrease in that of the extremities. In addition, the temperature of the space cabin exhibited a greater cooling power than did a test cabin on earth, despite the fact that they had similar temperature variations N B

**A82-40727 # Aortic and tibial bloodflow response to lower body negative pressure (LBNP).** J A Loeppky, E R Greene, D E Hoekenga, M D Venters, and M W Eldridge (Lovelace Foundation for Medical Education and Research, U.S. Veterans Administration Medical Center, Albuquerque, NM) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-141 to S-144 12 refs

Blood velocities in the ascending aorta from the suprasternal notch were determined by a 3.0 MHz pulse Doppler velocity meter (PD) for seven subjects before, during, and after progressive 5 min stages of LBNP. Changes in the stroke volume (SV) were calculated from the systolic velocity integrals, while the blood flow in the posterior tibial artery was estimated by using a unique 20 MHz PD. At -20 torr, mean SV fell by 11% and gradually declined by 48% with successive increments of LBNP to -60 torr. Mean tibial flow fell progressively with LBNP stress, due to an increase in the reverse flow component and a reduction in the peak forward flow and diameter. SV increased and the heart rate fell sharply during the first 15 sec of recovery. In two subjects, vasovagal symptoms were observed, during which the SV rose by 86% and more than compensated for the drop in heart rate. It is suggested that vasovagal presyncope is accompanied by a paradoxical increase in venous return and that the reduction in heart rate is the primary cardiovascular event N B

**A82-40728 # Effects of lower body negative pressure on the reliability of cardiovascular system using X-ray kymograms.** Y G Zorbas, Mr Sadeghi-Shoja, and S Khaligh (European Institute of Environmental Cybernetics, Athens, Greece) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-145, S-146 16 refs

The effects of lower-body negative pressure (LBNP) on man's cardiovascular system reliability (functional capacity) were investigated by the X-ray kymography method. Twenty-six experiments were conducted on 16 physically healthy males in the age group from 18 to 22 years. X-ray kymograms were recorded before and during the exposure to LBNP of -40 and -80 mm Hg. Diastolic, systolic and stroke volumes of the heart were computed. A decrease in the diastolic, systolic and stroke volumes and cardiac output, and contractile activity and an elevation in tilting of myocardium axis were determined. Under the influence of LBNP the reliability of the cardiovascular system exhibits an appreciable impairment (Author)

**A82-40729 # Vibration and decompression gas bubbles.** U I Balldin (Forsvarets Forskningsanstalt, Stockholm, Sweden) and A Spöröng (Kungl Karolinska Institutet, Stockholm, Sweden) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-147, S-148 7 refs

The paper describes experiments conducted to determine if vibrations, similar to those that may appear in helicopter flights, might also release decompression gas bubbles after diving. Subjects are exposed to intermittent hyperbaric conditions while performing bicycle ergometer work, followed by hypobaric exposure, which causes decompression gas bubbles in great amounts. During hypobaric exposure the subjects are exposed to alternating periods of 0.23 g sub z (peak) vibrations of 15 Hz and periods of nonvibrations. Results show that no significant differences in the release of decompression gas bubbles could be found between 15 Hz vibration and nonvibration conditions. Similar results are found in a few experiments using a 25 Hz vibration N B

**A82-40730 # Relation between physiological effects of gravitational forces and that of magnetic forces.** H Saiki, M Saiki, M Nakaya, M Sudoh, M Abe, and Y Taketomi (Jikei University, Tokyo, Japan) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-149, S-150 5 refs

Physiological functions of mice are examined during and after exposure to low magnetic fields (1% intensity of the geomagnetic field) under simulated hypogravitic conditions, and the results compared to those of geomagnetic field exposure. Results indicate a decline in the healing process of wounds inflicted with a punch to the dorsum under hypokinetic fields after exposure to low magnetic fields. In addition, the detrimental effects of hypokinetics on swimming capacity is attenuated by low magnetic fields. However, the deterioration in swimming capacity caused by hypokinetic exposure gradually ameliorates over time, and the swimming capacity returns to normal after a three month hypokinetic exposure N B

**A82-40731 # Orthostatic tolerance and exercise response before and after 7 days simulated weightlessness.** A Guell, L Braak, J Bousquet, M Barrere, and A Bes (Centre Hospitalier Universitaire Rangueil, Toulouse, France) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-151, S-152 5 refs

Four volunteers underwent orthostatic tests before and after a 7-day period of prolonged bedrest in antiorthostatic position (-4 deg). A +85 deg tilt test (head up) during 20 minutes and a squat-stand test were performed. Tests on an ergometric bicycle were also performed. Concerning orthostatic tolerance after the simulation, a greatly increased intolerance among two of the volunteers was noted, that can be translated as a presyncopal state with severe arterial hypotension, whereas the other two volunteers showed a paradoxical reaction with a hypertensive spike. The exercise response was also perturbed after, especially for one of the volunteers for whom the test had to be stopped. It is concluded that these results confirm the value of such a position when one intends to simulate the cardiovascular changes that occur during weightlessness (Author)

**A82-40732 # Postural control related to the different tilting body positions.** V Litvinenkova, F Hlavacka, and M Krzkova (Slovenska Akademia Vied, Ustav Normalnej a Patologickej Fyziologie, Bratislava, Czechoslovakia) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-153, S-154

The effects of 5 minutes exposure to different body tilting positions on the patterns of postural control were investigated. By means of a stabilographic method the influence of recumbent (supine) position - head horizontal 0 deg, head up +60 deg, head down -15 deg and sitting position head +90 deg was measured. The evaluated parameters of the posture stability were: statokinesigram area (A) and the velocity index of body sways (I). Thirty-one healthy men aged 18-24 were tested after all tilting exposures with eyes open and eyes closed. Romberg quotient (R) was computed from data obtained. Horizontal position 0 deg induced the mildest decrease of postural stability. The most destabilizing effect after +60 deg tilting was found. The significant changes were manifested only in subjects with eyes closed. It was the R for A which reflected the reduced orthostatic tolerance most sensitively (Author)

**A82-40733 # The reaction of simulated and true weightlessness on digestive tract of rats.** P Groza, A Bordeianu, A Boca, and S Cananau (Academia de Stiinta Medicale, Bucharest, Rumania) (*International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980*) *Physiologist, Supplement*, vol 23, Dec 1980 (1982), p S-155, S-156

In order to better differentiate the reactions produced by stress and weightlessness, changes in the digestive tract of rats produced by restraining their movements are determined and compared with the changes produced in true space flight. Histochemical studies show that 15-30 days of terrestrial hypokinesia produces modifications similar to those evoked by a space flight lasting 18.5 days,

including decreased mucopolysaccharide secretion in different digestive organs, increased secretion of several enzymes of the intestinal wall, and increased secretory activity of antral and duodenal gastrin secreting cells. Gastric acid and pepsin secretions, as well as secretions of plasmatic corticosterone, increase only during terrestrial hypokinesia, and not during space flights, and are a result of stress reactions  
N B

**A82-40734** # International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, September 29-October 2, 1981, Proceedings. Physiologist, Supplement, vol 24, Dec 1981 (1982) 126 p

The proceedings of the Third Annual Meeting of the IUPS Commission on Gravitational Physiology are presented. Particular consideration is given to such topics as the reduction in renal artery blood flow impedance during upright tilt in man, the atrophy of rat skeletal muscles in simulated weightlessness, induced hypokinesia and antorthostasis as a simulation of weightlessness, the restraint of animals in space research, and cellular aspects of gravitational biology. Attention is also given to embryonic development during chronic acceleration, cardiac and cerebral vascular adaptation to gravitational stresses in man, evidence for arrested bone formation during space flight, and gravity perception and asymmetric growth in plants  
B J

**A82-40735** # Reduction in renal artery blood flow impedance during upright tilt in man. J A Loeppky, E R Greene, and M W Eldridge (Lovelace Foundation for Medical Education and Research, Albuquerque, NM) (International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981) Physiologist, Supplement, vol 24, Dec 1981 (1982), p S-1, S-2 6 refs

Because of the relative inaccessibility of the renal vascular bed, there is little information on the dynamics of renal artery blood flow in response to alterations in gravitational stress in man. In the present study, a 50 MHz real-time two-dimensional pulsed Doppler duplex scanner was used to noninvasively characterize the changes in renal artery impedance and flow during orthostasis. These changes were then compared to changes in the central circulation in an attempt to define the redistribution of pressures and flow occurring in the central and renal vascular beds  
B J

**A82-40736** # Relevance of aldosterone on circulatory, renal and blood reactions during simulated weightlessness and on aerobic metabolic rate. W Skipka and J Stegemann (Köln, Deutsche Sporthochschule, Cologne, West Germany) (International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981) Physiologist, Supplement, vol 24, Dec 1981 (1982), p S-3, S-4 13 refs

The present study examined the relevance of the decrement in aldosterone level during simulated weightlessness by head-out water immersion (WI) with respect to circulatory, renal, and blood reactions. Four-hour WI experiments were performed in which aldosterone was substituted by injections of Aldocorten at the beginning and after two hours of WI. Red cell 2,3-DPG concentration increased significantly in the opposite direction to that of the controls (WI without aldosterone). Additional experiments showed that aldosterone significantly augmented oxygen uptake during work loads. This indicates that the WI-induced decrease of performance capacity can be due to a concomitant aldosterone decrement  
B J

**A82-40737** # Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129. M Poppei, K Hecht, V S Oganov, V Ia Klimovitski, T Schlegel, D Sass, E Wachtel, and V S Magedov (Berlin, Humboldt-Universität, Berlin, East Germany, Ministerstvo Zdravookhraneniya SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981) Physiologist, Supplement, vol 24, Dec 1981 (1982), p S-7, S-8 7 refs

The locomotor avoidance reflex of rats on Cosmos 1129 was evaluated in order to determine the relationship between sensory and motor functions. An automatic timing clock was used to study the central nervous reaction time and the motor reaction time. Changes in muscle structure after 18 and one-half days of space flight were found to be reflected in changes in motor reaction. Markedly shortened motor reaction times pointed to a motor hyperactivity related to an increased muscle metabolism, indicating the effects of weightlessness and a stress reaction  
B J

**A82-40738** \* # Atrophy of rat skeletal muscles in simulated weightlessness. D D Feller, H S Ginoza, and E R Morey (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, CA) (International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981) Physiologist, Supplement, vol 24, Dec 1981 (1982), p S-9, S-10 11 refs

A hypokinetic rat model was used for elucidation of the mechanism of skeletal muscle wasting which occurs in weightlessness. Rats were suspended from a back-harness with the head tilted downward and the hind limbs totally unloaded. A progressive decrease in the size of the soleus muscle from suspended rats was

observed as a function of time. The rate of protein degradation of the homogenates from the soleus muscles of suspended and control animals was not significantly different. The rate of cell-free protein synthesis was severely repressed in the atrophied muscle. An initial rise in the levels of plasma glucose and corticosterone was observed on the second day of suspension, but they subsequently returned to normal values  
(Author)

**A82-40739** # The effect of hypokinesia and hypoxia on the function of muscles. T Szilagyi, J Hideg, E Berenyi, A Pozsgai (Hungarian People's Army, Medical Corps, Hungary), A Szoor (Debreceni Orvostudományi Egyetem, Debrecen, Hungary) (International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981) Physiologist, Supplement, vol 24, Dec 1981 (1982), p S-11, S-12 5 refs

Experiments were performed on adult male rats to study the effects of hypokinesia and hypoxia on the extensor digitorum longus, gastrocnemius, and soleus muscles. It is shown that plaster cast immobilization causes rapid and pronounced structural and functional changes in all three types of muscles, first of all in the antigravitational soleus muscle. These changes are similar to those observed in weightlessness. Hypokinesia causes slight changes which develop slowly, while hypoxia (the equivalent of 7000 m above sea level for eight hours a day) intensifies the effect of hypokinesia  
B J

**A82-40740** # Analysis of transient cardiovascular response to orthostatic stress using noninvasive methods. H Pessenhofer, G Schwaberg, N Sauseng, and T Kenner (Graz, Universität, Graz, Austria) (International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981) Physiologist, Supplement, vol 24, Dec 1981 (1982), p S-13, S-14 7 refs

The application of noninvasive methods for the analysis of dynamic control phenomena in the cardiovascular system on clinical and space research problems is demonstrated. In an investigation, performed in 10 volunteers, the transient responses of heart period, systolic time intervals and impedance cardiogram were recorded immediately after a sudden change in body position from horizontal to vertical (tilt-table), beat-per-beat for one minute. To estimate the time course of variables which could not be directly determined by noninvasive methods, a mathematical model of the physiological system was used, the free parameters of which were estimated by means of a systems identification procedure. The resulting time functions of the measured variables and of the variables calculated on the basis of the model (mean arterial pressure, enddiastolic filling pressure, total peripheral resistance) demonstrated the interplay between baroreceptor reflex and Frank-Starling-mechanism in the adjustment of the mean arterial pressure after a change in body position  
(Author)

**A82-40741** \* # Antiorthostatic hypokinesia and circulation in the rat. V Popovic (Emory University, Atlanta, GA) (International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981) Physiologist, Supplement, vol 24, Dec 1981 (1982), p S-15, S-16 Grant No. NGR-11-001-009

Circulatory mechanisms that occur during exposure to head-down hypokinesia as well as during readaptation to control conditions were studied on unanesthetized unrestrained Sprague-Dawley rats exposed to hypokinesia for seven days. The heart rate was slightly elevated, and the right atrial pressure increased to 4 mm Hg, but returned to 0 mm Hg after three days of exposure. Mean arterial blood pressure decreased from 118 to 100 mm Hg during early exposure to antiorthostatic hypokinesia. Cardiac output and stroke volume of resting rats increased during early exposure to hypokinesia but decreased continuously during the next seven days. The results indicate that antiorthostatic hypokinesia induces circulatory changes similar to those seen in astronauts after several days of exposure to 0 g forces  
B J

**A82-40742** # Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization. I Sziklai, D Szekely, Z Kiss, and F Guba (Szegedi Orvostudományi Egyetem, Szeged, Hungary) (International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981) Physiologist, Supplement, vol 24, Dec 1981 (1982), p S-17, S-18

**A82-40743** # Effects of prolonged bedrest in antiorthostatic position on rCBF measured by <sup>133</sup>Xe inhalation technique - Effects of clonidine. A Guell, G Victor, A Bru, P Montastruc, and A Bes (Centre Hospitalier Universitaire Rangueil, Toulouse, France) (International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981) Physiologist, Supplement, vol 24, Dec 1981 (1982), p S-19, S-20 12 refs

Experiments involving prolonged bedrest in antiorthostatic position were performed in order to simulate cardiovascular changes observed in weightlessness. Six young healthy subjects were placed in strict bedrest in a -4-deg antiorthostatic position for seven days. The rCBF (regional cerebral blood flow) measurements were made by an Xe-133 inhalation method, three of the subjects received 0.450 mg of clonidine during the experiment. A constant increase in rCBF was observed during the first 12 hours in subjects who did not receive clonidine, at the 72nd

hour, all values returned to the basal state. These findings agree with the rapid correction of hemodynamic disturbances observed in the first days of weightlessness. In subjects treated with clonidine, the increase in rCBF did not occur.

B J

**A82-40744 \* # Suspension restraint - Induced hypokinesia and antiothostasis as a simulation of weightlessness.** X J Musacchia, J M Steffen (Louisville, University, Louisville, KY), and D R Deavers (College of Osteopathic Medicine and Surgery, Des Moines, IA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-21, S-22 5 refs. Grants No NsG-2191, No NsG-2325

Muscle, renal, fluid and electrolyte responses were measured in suspended rats, the hind limbs are non-load bearing and the front limbs can be used for feeding and grooming. Hind limb hypokinesia reverses after removal from the suspension harness. This suspension system is adjustable for a head-down tilt to produce antiothostatic responses which are also reversible. Responses to hypokinesia or antiothostatic hypokinesia for up to 14 days were measured, e.g., muscle atrophy, soleus greater than gastrocnemius equals plantaris greater than extensor digitorum longus, kaliuresis, and increased excretion of urea, NH<sub>3</sub>, and 3 methylhistidine. Muscle protein loss, a response to a reduction in RNA, is also reversible. A head-down tilt for 7-14 days results in diuresis and natriuresis. These changes are reversed within 24 hours after removal from the restraint harness. Physiological effects of suspension restraint can be used to simulate and predict responses to microgravity exposure. (Author)

**A82-40745 # Root cell gravireaction - Hormone interaction.** P E Pilet (Lausanne, Université, Lausanne, Switzerland) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-25 to S-28 9 refs

Some interactions between two endogenous hormones, Indole-3-yl-acetic acid (IAA) and abscisic acid (ABA), were studied in gravistimulated maize roots (cultivars of Zea mays). It is found that the growth reaction of the gravistimulated roots is regulated by the IAA movement, which is strongly acropetal and by the ABA transport, which is preferentially basipetal. These two hormones, being found in larger amounts in the lower part of the growing region, induce a growth inhibition in this region, causing a downward root curvature. (Author)

**A82-40746 # The effect of gravity on the distribution of plant growth substances in plant tissues.** W Hartung (Würzburg, Universität, Würzburg, West Germany) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-29 to S-32 14 refs. Research supported by the Deutsche Forschungsgemeinschaft

The distribution of abscisic acid (ABA) in root tip tissues and of indole acetic acid (IAA) in shoot tissues of several plants is not affected by gravity. Pretreatment with ABA (roots) and IAA (shoots), however, increases the geotropic reaction of the organs. Treatment of the roots and shoots that alters the pH-gradients within the cells and thus the cellular phytohormone distribution reduces the sensitivity of horizontally placed plant organs to gravity. The results communicated in this paper cast doubt on the validity of the Cholodny-Went theory. It appears possible that gravity influences the cellular compartmentation of plant growth substances. (Author)

**A82-40747 # Involuntary and voluntary mechanisms for preventing cerebral ischemia due to positive /Gz/ acceleration.** E H Wood, E H Lambert, and C F Code (Mayo Medical School, Rochester, MN) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-33 to S-36 11 refs

**A82-40748 # Restraint of animals in space research.** R R Burton, J W Burns, and A H Smith (USAF, School of Aerospace Medicine, Brooks AFB, TX, California, University, Davis, CA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-41 to S-44 26 refs

The restraint of animals for orientation purposes in a space (zero G) environment for research purposes is considered. Attention is given to types of restraint, restraint tolerance criteria, and animal training, adaptation, and selection for restraint. Potential problems concerning animal restraint in a space environment are examined. (Author)

**A82-40749 \* # Animal models for simulating weightlessness.** E Morey-Holton and T J Wronski (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, CA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-45 to S-48 17 refs

NASA has developed a rat model to simulate on earth some aspects of the weightlessness alterations experienced in space, i.e., unloading and fluid shifts. Comparison of data collected from space flight and from the head-down rat

suspension model suggests that this model system reproduces many of the physiological alterations induced by space flight. Data from various versions of the rat model are virtually identical for the same parameters, thus, modifications of the model for acute, chronic, or metabolic studies do not alter the results as long as the critical components of the model are maintained, i.e., a cephalad shift of fluids and/or unloading of the rear limbs. (Author)

**A82-40750 # Results of investigations of weightlessness effects during prolonged manned space flights onboard Salyut-6.** O P Kozorenko, A I Grigor'ev, and A D Egorov (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-49 to S-54 15 refs

Salyut-6 results indicate that a prolonged exposure to weightlessness may induce homeostatic changes in various physiological systems, bringing the body to a level of functioning that is different from that on earth. The physiological changes observed during and after flights were reversible. Return to normal occurred after a relatively short period of readaptation. There was no linear correlation between flight duration and the level of inflight and postflight reactions. (Author)

**A82-40751 # Results of biosatellite studies of gravity-dependent changes in the musculo-skeletal system of mammals.** V S Oganov (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-55 to S-58 28 refs

Results of rat experiments performed on Cosmos satellites indicate that space flight may induce not only atrophic changes in the slow antigravitational muscles but also adaptive and biologically expedient transformations of phenotypes of muscle fibers, including (in all likelihood) reprogrammed synthesis of contractile muscle proteins. This may cause the rearrangement of the functional profile of muscles: the slow antigravitational soleus muscle acquires the features typical of fast muscles, while the fast brachialis muscle gains those peculiar to slow muscles. (Author)

**A82-40752 # Mechanisms of the effects of weightlessness on the motor system of man.** I B Kozlovskaya, Iu V Kreidich, and A S Rakhmanov (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-59 to S-64 15 refs

A broad spectrum of motor effects of weightlessness has been revealed, including changes in muscle properties, shifts in sensory systems and reflex mechanisms, and perceptual and coordination disorders. These changes are usually attributed primarily to weight-bearing unloading and related muscle atrophy. But clinical and physiological examinations of the motor function performed during 140 and 175 day flights on Salyut-6 are at variance with this idea and point to a multifactorial genesis of the postflight changes. In particular, the magnitude and duration of changes in different components of the motor system of crew members were found to be uncorrelated. (Author)

**A82-40753 # Adaptation of the rat skeleton to weightlessness and its physiological mechanisms - Results of animal experiments aboard the Cosmos-1129 biosatellite.** D J Simmons (Washington University, St Louis, MO) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-65 to S-68 12 refs

Results from Cosmos-1129 and from other Cosmos biosatellites have provided an incisive description of the effect of null gravity on the kinetics of the rat skeleton, and its cells and mineral metabolism. The applicability of the rat model to the adult human astronaut skeleton has yet to be validated in all of its aspects. The rat model is least controversial in terms of changes in bone matrix formation. It is most controversial in terms of how it relates to the resorption/remodeling rates of bone. (Author)

**A82-40754 # Cellular aspects of gravitational biology.** M G Tairbekov and G P Parfenov (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-69 to S-72 20 refs

The mechanisms of energy use and material transport through the walls of a biologic cell are reviewed, along with the results of spaceborne bioscience experiments, to conclude that cells with dimensions of one cubic millimeter or less function independent of a gravity field. Additionally, the absence of gravity-induced convection gradients in space environments enhance the equilibrated processes of cell functions. The effects become more complicated with multicellular species, which may have both vegetative and animal components and display teleocentric behavior during growth. Changes which occur in multicellular species, or in a cell which is part of a multicellular organism, are concluded to



occur due to metabolic shifts caused by energy process changes within and outside of gravity fields  
M S K

**A82-40755 \* # Embryonic development during chronic acceleration.** A H Smith and U K Abbott (California, University, Davis, CA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-73, S-74 7 refs Grant No NSG-7493

Experiments carried out on chicken eggs indicate that the embryo is affected during very early development, especially over the first four days, and during hatching. In the first four days, the brain develops as well as the anlage for all other organs. In addition, the heart commences to function and the extraembryonic membranes that compartmentalize the egg contents form. The latter require an appreciable extension and folding of tissue which may be disrupted by the mechanical load. Observations of embryonic abnormalities that occur during chronic acceleration suggest an inhibition of development of the axial skeleton, which is rarely seen otherwise, a general retardation of embryonic growth, and circulatory problems. The final stages of development (after 18 days) involve the uptake of fluids, the transition to aortal respiration, and the reorientation of the embryo into a normal hatching position. At 4 G mortality is very high during this period, with a majority of embryos failing to reorient into the normal hatching position  
C R

**A82-40756 \* # Suppression of osteoblast differentiation during weightlessness.** W E Roberts, P G Mozsary (University of the Pacific, San Francisco, CA), and E R Morey (NASA, Ames Research Center, Moffett Field, CA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-75, S-76 Research supported by the Pacific Dental Research Foundation, Grants No NCA2-OR-588-002, No NIH-DE-05136, No NIH-2-S07-RR-05301

It is pointed out that associated with weightlessness is a marked depression or arrest of bone formation. Although the mechanism of this effect is unknown, it probably involves a failure of osteogenic induction. The present study's objective is to determine if weightlessness alters osteoblast differentiation, as evidenced by a change in relative distribution of large to small nuclei in rat mandibular periodontal ligament of the maxilla. In conjunction with the U.S./USSR Biological Satellite Program, male Wistar rats were flown aboard a modified Soviet Vostok spacecraft (Cosmos 1129). The results of the study are discussed. Morphometric investigations suggest that depleted numbers of preosteoblasts may be an important factor in the inhibition of bone formation during weightlessness  
G R

**A82-40757 \* # Clinostat exposure and symmetrization of frog eggs.** G W Nace (Michigan, University, Ann Arbor, MI) and J W Tremor (NASA, Ames Research Center, Biosystems Div., Moffett Field, CA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-77, S-78 6 refs Grant No NAGW-29, Contract No NAS2-10945

Since the orientation of unfertilized eggs and the righting of eggs after grey crescent formation do not affect the axes, attention here is directed toward a comparative study of the initial rotation of the fertilized egg, the so-called rotation of orientation (R-of-O). The goal of the investigation is to determine the timing and dynamics of the R-of-O (as distinct from inversion rotations), to confirm prior observations, and to examine the influence of gravity compensation at periods that might be crucial. Gravity compensation for 1 hr during the R-of-O is found to yield fewer abnormalities. It is hypothesized that it changes the axes and that return to normal conditions permits regulation. Longer exposure is found to yield more abnormalities, perhaps by perturbing both the action of the aster and regulation  
C R

**A82-40758 \* # The intracellular responses of frog eggs to novel orientations to gravity.** G P Radice, A W Neff, and G M Malacinski (Indiana University, Bloomington, IN) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-79, S-80 5 refs Grant No NAGW-60

It is found that multiple short doses of ultraviolet light are as effective as a single large dose in producing neural defects. In addition, 180 deg rotation (inversion) of irradiated eggs reduces the ultraviolet effect. Since yolk platelets may be the gravity sensing mechanism, their size, density, and distribution in normal and inverted eggs are investigated. Large platelets are denser and for the most part are in a distinct zone in the vegetal hemisphere, whereas small platelets are less dense and occur in the animal hemisphere. When inverted, the large platelets flow into the animal hemisphere as a coherent mass and partially displace the small platelets. Inversion is thought to rearrange cytoplasmic components necessary for later neural development into an appropriate configuration  
C R

**A82-40759 \* # Gravity sensing system formation in tadpoles /Rana temporaria/ developed in weightlessness simulation.** J Neubert (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugmedizin, Cologne, West Germany) (*International Union of Physiological Sciences,*

*Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-81, S-82 6 refs

**A82-40760 \* # Short term gravity effects on volume homeostasis in man - Assessment of transvascular fluid shifts after graded tilt.** H Hinghofer-Szalkay, T Kenner, and M Moser (Graz, Universität, Graz, Austria) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-83, S-84

**A82-40761 \* # Effect of sustained Gz acceleration on lung fluid balance - An ultrastructural study.** W J Weidner, L F Hoffman, and D O DeFouw (California, University, Davis, CA, New Jersey, College of Dentistry and Medicine, Newark, NJ) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-85, S-86

In order to examine the effects of sustained acceleration on lung fluid balance, chickens were centrifuged at +2Gz or +4Gz for one hour. At the end of the centrifuge run, the animals were immediately anesthetized with pentobarbital and the lungs were fixed by tracheal instillation at 20 cm H<sub>2</sub>O pressure with 2% glutaraldehyde. Interstitial pulmonary edema was observed in those animals subjected to 4Gz acceleration. Micromorphometric data indicate that thickening of the pulmonary interstitial space separating alveolar epithelial cells and capillary endothelium occurred in the 4Gz group. Both 2G and 4G acceleration were associated with a decrease in mean capillary diameter. Endothelial vesicular density was progressively reduced in upper and middle lung sections at 2G and 4G, while this parameter was progressively increased in dependent lung sections. Results suggest that pulmonary edema can occur at acceleration intensities below 5 Gz if centrifuge runs are prolonged  
(Author)

**A82-40762 \* # Vestibular effects of water immersion and Clonidine.** S Vesterhauge, A Mansson, F Bonde-Petersen, P Norsk, and K Zilstorff (Rigshospitalet, Copenhagen, Universitet, Copenhagen, Denmark) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-87, S-88 6 refs Research supported by the Danish Space Board and Boehringer Ingelheim

Attention is given to the way in which circulatory changes modify the vestibular function and the way in which they contribute to the development of space motion sickness. Circulatory changes similar to those occurring during microgravity can be induced by head-out water immersion, these changes are modified here by the administration of Clonidine. It is shown that circulatory changes induced by simulated weightlessness increase the unphysiologic caloric response but do not influence the physiological function of the semicircular canals. Clonidine is found to reduce the caloric response and increase the rotatory phase lag, probably due to an 'unspecific' central sedation rather than to circulatory changes  
C R

**A82-40763 \* # The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity.** F Bonde-Petersen, A Guell, K Skagen, and O Henriksen (Copenhagen, Universitet, Copenhagen, Denmark, Centre Hospitalier Universitaire Rangueil, Toulouse, France) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-89, S-90 8 refs

The influence of prolonged bedrest (BR) on the venous compliance (VC) and the vasoconstrictor response in the arterioles during local increases in hydrostatic pressure and during tilt are investigated. BR is also combined with Clonidine medication. Clonidine stimulates the CNS cardiovascular depressor center and the peripheral alpha-receptors. Clonidine's main effect is found to be as a central sympathetic nervous activity (SNA) depressor. Water immersion per se is found to depress SNA, an additive effect of water immersion and Clonidine shows an additional reduction of splanchnic vascular resistance down to 50% of control values. This effect counteracts the increased total peripheral resistance which otherwise would be a consequence of an increased alpha stimulation. A fall in mean arterial pressure is therefore observed  
C R

**A82-40764 \* # Cardiovascular effects of Clonidine during 20 hours head down tilt /-5 deg/.** P Norsk, F Bonde-Petersen, and J Warberg (Copenhagen, Universitet, Copenhagen, Denmark) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept. 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-91, S-92 8 refs

The cardiovascular effects of Clonidine during 20 hr of bedrest where the head is tilted downward by 5 deg are investigated, as are the effects of Clonidine on exercise capacity and orthostatic tolerance before and after the bedrest. The stress induced by the 20 hr of bedrest is found to be counteracted by the central depressor effect of Clonidine on the heart. The peripheral effect of Clonidine increasing forearm vascular resistance, venous tone, and lung tissue volume facilitates the adaptation to the microgravity environment  
C R

**A82-40765 \* # Cardiac and cerebral vascular adaptation to gravitational stresses in man.** A Belluschi (Ospedale Maggiore Ca'Granda, Milan,

Italy) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-93, S-94

A polygraphic method comprising a cerebral rheogram (REG), digital plethysmography, and a phonocardiogram (PCG) is used in analyzing the behavior of the cerebral vascular resistances and that of the cardiac output. The influence of the gravitational vector, which is constant in its direction, is found to change for the different postures and in the arterial and venous network, the brain, and the peripheral area. It is concluded that the gravitational vector is a stimulus for the regulation of the arterial tone. Another finding is that the gravitational vector associated with the thorax bellows is a coefficient of the venous outflow and as such a stimulus to the cerebral capillary vascular reactions. C R

**A82-40766 \* # Response of rat body composition to simultaneous exercise and centrifugation at 3.14g.** G C Pitts (Virginia, University, Charlottesville, VA) and J Oyama (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, CA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-95, S-96 9 refs

A study is described calling into question the hypothesis that an increased physical load during chronic centrifugation contributes to the body composition changes observed in centrifuged rats. Considering fat-free and fat-free dry masses of the total body and carcass, it is seen that centrifugation combined with either wheel running or restraint reduced these masses to approximately 85% of the respective 1-g values, that is, the same result with either sedentary rats or rats running several hundred meters per day. It is pointed out that if an effect of a centrifugation-induced load is present but hidden by opposing factors, an analysis of variance should reveal it as an interaction between acceleration and other variables, however, no such interactions are found here. Tables are included emphasizing the pervasive influence of chronic centrifugation after only 12 days exposure. C R

**A82-40767 \* # Evidence for arrested bone formation during spaceflight.** R T Turner, J D Bobyn, P Duvall, E R Morey, D J Baylink, and M Spector (NASA, Ames Research Center, Moffett Field, CA, South Carolina, Medical University, U.S. Veterans Administration Medical Center, Charleston, SC, U.S. Veterans Administration, Medical Center, Tacoma, WA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-97, S-98 7 refs

Addressing the question of whether the bone formed in space is unusual, the morphology of bone made at the tibial diaphysis of rats before, during, and after spaceflight is studied. Evidence of arrest lines in the bone formed in space is reported suggesting that bone formation ceases along portions of the periosteum during spaceflight. Visualized by microradiography, the arrest lines are shown to be less mineralized than the surrounding bone matrix. When viewed by scanning electron microscopy, it is seen that bone fractures more readily at the site of an arrest line. These observations are seen as suggesting that arrest lines are a zone of weakness and that their formation may result in decreased bone strength in spite of normalization of bone formation after flight. The occurrence, location, and morphology of arrest lines are seen as suggesting that they are a visible result of the phenomenon of arrested bone formation. C R

**A82-40768 # Validation of a new method for studying the effects of vibration on the primate spine.** P Quandieu and C Nagues (Laboratoire Central de Biologie Aérospatiale, Paris, France) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-99, S-100

The results obtained from miniature accelerometers implanted anteriorly on the vertebral bodies of primates are discussed. It is found that when stimulated by vibration, the intervertebral disk behaves as a low-pass filter. The filter is linear, even when the amplitude of stimulation acceleration reaches relatively high levels (0.4 G). Muscle activity causes a variation in the transfer properties of the disk. Muscle contraction improves its low-pass properties (lower transmission in the high-frequency range), whereas muscle relaxation causes a translation of filter properties towards the high-frequency range (transmission at 80 Hz improving with nembutal and curare). Removal of the nucleus pulposus brings about a shift in resonance to the high-frequency range, the occurrence of nonlinearity, and a serious increase in transfer toward that high-frequency range of the lumbar disks nearest the sacrum. C R

**A82-40769 \* # Chronic acceleration and brain density.** L F Hoffman and A H Smith (California, University, Davis, CA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-101, S-102 9 refs Grant No. NSG-7493

Tests carried out on rabbits show that the effect of chronic acceleration is not uniform among the various tissues studied. Although body mass is reduced by the treatment, as expected, no change is apparent in brain mass or in the density of cerebrospinal fluid. Acceleration-induced changes are encountered in tissue den-

sity, the myocardium exhibiting a transient increase followed by an exponential decrease toward a limit and the brain showing an arithmetic increase in density with continued exposure to 2.5 G. The data are seen as suggesting that a specific brain load is not a regulated phenomenon and that no physiological processes occur to attenuate the increased load imposed by the hyperdynamic environment. An equation is derived indicating that the stimulus potential per unit of brain load increases with body size, even though brain density decreases and cerebrospinal fluid density increases. C R

**A82-40770 # Gravity only dependent receptor field of the vestibular sensors - Its significance in orbital flight.** T Gualtierotti (Milano, Università, Milan, Italy) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-103, S-104 5 refs

In the bull frog the gravity dependent receptive field of tonic and phasic-tonic vestibular receptors covers nearly the entire 360 deg solid angle. Consequently any given position of the head will modify the adapted firing rate of the entire family of statoreceptors, in an orderly pattern. As a result, stationary responses to gravity effectively modulate the evoked activity of the vestibular receptors due to head movement. In '0' g this organized gravity dependent pattern disappears altering the amplitude and mode of the vestibular responses to head movements. The problem is further complicated by the random 'wandering' of the cell mean frequency which is orders of magnitude larger in '0' g than on earth. (Author)

**A82-40771 # Relation between physiological effects of gravitational forces and that of magnetic forces.** II. H. Saiki, M. Sudoh, M. Nakaya, and M. Abe (Jikei University, Tokyo, Japan) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-105, S-106 6 refs

The effects of various intensities of magnetic field (low, geomagnetic, and high) on the metabolic and cardiovascular functions of albino rats are investigated under various gravity conditions. The high magnetic field tends to diminish the effects of hypodynamic exposure in such parameters as urine volume and metabolic rate at rest. The low magnetic field tends to attenuate the effect of the hypodynamic exposure in such parameters as urine volume and the excretion rate of K(+) and Ca(2+). C R

**A82-40772 \* # Core temperature and brainstem auditory evoked potentials as complementary noninvasive measures of central neural function during exposure to hypergravic fields.** T A Jones and J M Horowitz (California, University, Davis, CA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-107, S-108 Grant No. NSG-2234, Contract No. NAS5-33146

**A82-40773 # Response of cultured cells to hyper- and hypogravity.** A. Tschopp, A. Cogoli (Zürich, Eidgenössische Technische Hochschule, Zürich, Switzerland), and W. Briegleb (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugmedizin, Cologne, West Germany) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-109, S-110 Swiss National Science Foundation Grant No. 3.499-0.79

Preliminary results obtained with four cell lines at high-g and with lymphocytes monitored in a fast-rotating clinostat are described. The experiments shown that gravity has an influence on cell growth that is independent of cell line. High-g increases the growth rate, whereas low-g has an inhibitory effect. At high-g, no correlation is found between g-level and cell growth, the high-g effect remains essentially the same at 3-g, 20-g, and 40-g. C R

**A82-40774 \* # Temperature and behavioral responses of squirrel monkeys to 2Gz acceleration.** C. A. Fuller (California, University, Riverside, CA), J. Tremor, J. P. Connolly, and B. A. Williams (NASA, Ames Research Center, Biosystems Div., Moffett Field, CA) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol 24, Dec 1981 (1982), p S-111, S-112 6 refs NSF Grant No. BNS-79-2441, Grant No. PHS-BRD-RR-09070, Contract No. NAS2-10536

This study examines the responses of squirrel monkeys to acute +2Gz exposure. Body temperature responses of loosely restrained animals were recorded via a thermistor in the colon. Behavioral responses were recorded by video monitoring. After baseline recording at 1G, monkeys were exposed to 2G for 60 min. The body temperature started to fall within 10 min of the onset of centrifugation and declined an average of 1.4°C in 60 min. This is in contrast to a stable body temperature during the control period. Further, after a few minutes at 2G, the animals became drowsy and appeared to fall asleep. During the control period, however, they were alert and continually shifting their gaze about the cage. Thus, primates are susceptible to hypergravic fields in the +Gz orientation. The depression in primate body temperature was consistent and significant. Further, the observed drowsiness in this study has significant ramifications regarding alertness and performance in man. (Author)

**A82-40775 \* # Gravity perception and asymmetric growth in plants - A model derived from the grass pulvinus.** P. Dayanandan, C. I. Franklin, and P. B. Kaufman (Michigan, University, Ann Arbor, MI) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol. 24, Dec 1981 (1982), p. S-113, S-114. Grant No. NAGW-34.

It is pointed out that gravitropic responses in plants involve asymmetric growth. On the basis of the geometry of growth response in grass leaf sheath pulvinus, a general model is proposed for gravitropism in multicellular plant organs. The negative gravitropic response of a pulvinus is a result of cell elongation involving all but the uppermost region of a horizontally placed organ. Whereas the uppermost region does not grow, the lowermost region elongates maximally. The regions between elongate to intermediate extents. An expression is given relating the angle of curvature of the organ to the diameter and initial and final lengths of the organ. It is shown that the response of the individual cells can be expressed as inherent sensitivity to gravitational stimulus according to a particular equation. C. R.

**A82-40776 # ADH suppression under immersion combined with dehydration.** H. von Aemlin, M. Laniado, L. Röcker, K. Kirsch, H. J. Wicke, and I. Busch (Berlin, Freie Universität, Berlin, West Germany) (*International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, Sept 29-Oct 2, 1981*) *Physiologist, Supplement*, vol. 24, Dec 1981 (1982), p. S-115.

It is assumed that under zero gravity, an increased central blood volume is a concomitant of elevated plasma osmolality. This is seen to present a problem with respect to ADH secretion because, on the one hand, increased plasma osmolality stimulates ADH secretion whereas, on the other, an increase in central blood volume suppresses ADH secretion. The experiment described here involves a regimen of thermal dehydration that is followed by either head-out immersion or chair rest. The immersion is found to lead to a volume shift of about 700 ml into the intrathoracic compartment. Therefore, given high plasma osmolality combined with hypovolemia, after thermal dehydration the maximal stimulatory drive for ADH secretion will be counteracted by immersion. C. R.

**A82-40885 # Human factor and flight safety.** J. C. Wanner. In *International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings Volume 1*. New York, American Institute of Aeronautics and Astronautics, 1982, p. 83-96.

Design considerations developed to assist human operators of the Concorde in emergency situations are explored for principles which may be extended to other complex machine control design problems. Noting that with complex machinery, no one factor can nominally be identified as the only cause of an accident, each accident is considered to be a chain of events. In-flight accidents occur because of pilotability incidents, aircraft control sensitivity to perturbation incidents, and maneuverability incidents, which may have to do solely with changing the functional status of the aircraft. Characteristics of human attentiveness, a natural inclination to search for data, and the ability to compensate for an altered workload are outlined. Recommendations are given that information relayed by instruments be useful, that information follow anticipation, alarms be easy to identify, and that necessary appropriate actions be limited in number. M. S. K.

**A82-41122 \* Ultrasonic determination of thermodynamic threshold parameters for irreversible cutaneous burns.** J. H. Cantrell, Jr. (NASA, Langley Research Center, Hampton, VA) *Acoustical Society of America, Journal*, vol. 72, Aug 1982, p. 337-339. 10 refs.

In vivo ultrasonic measurements of the depth of conductive cutaneous burns experimentally induced in anesthetized Yorkshire pigs are reported as a function of burn time for the case in which the skin surface temperature is maintained at 100°C. The data are used in the solution of the one-dimensional heat diffusion equation with time-dependent boundary conditions to obtain the threshold temperature and the energy of transformation per unit mass associated with the transition of the tissue from the state of viability to the state of necrosis. The simplicity of the mathematical model and the expediency of the ultrasonic measurements in studies of thermal injury are emphasized. (Author)

**A82-41195 Molecular basis for the genetic code.** M. Shimizu (Tokyo, University, Tokyo, Japan) *Journal of Molecular Evolution*, vol. 18, July 1982, p. 297-303. 30 refs.

It was found by using the CPK molecular model that holes on the complexes of four nucleotides (C4N) on the tRNAs, namely complexes of the anticodon bases with the discriminator base at 4th position of 3' end, had lock and key relations to the corresponding protein amino acids. Various general features of the universal and mitochondrial genetic codes were easily explained in terms of the C4N model. The recognition mechanism of the tRNA by the aminoacyl-tRNA-synthetase is closely correlated with the formation of the C4N on the Rossmann fold on the synthetase. The meaning of the hypermodification of the tRNA base next to the third anticodon base and other phenomena were also discussed. (Author)

**A82-41196 \* Chemical evolution. XL - Clay-mediated oxidation of diaminomaleonitrile.** J. P. Ferris, W. J. Hagan, Jr., K. W. Alwis, and J. McCrea (Rensselaer Polytechnic Institute, Troy, NY) *Journal of Molecular Evolution*, vol. 18, July 1982, p. 304-309. 30 refs. NSF Grant No. 79-24364, Grant No. NGR-30-018-148.

The inhibition of the oligomerization of HCN by montmorillonite clays is shown to be caused by oxidation of diaminomaleonitrile (DAMN) by ferric ion in the clay lattice, with ferrous ion and oxalic acid the reaction products. It is demonstrated that diminosuccinonitrile is the initial reaction product and is rapidly hydrolyzed to oxalic acid and HCN. The same oxidative transformations are effected by ferric ion bound to Dowex 50, ferric ion in solution, and  $Ni(NH_3)_6^{2+}$ . The rate of reaction of DAMN indicates no catalytic role for the clay in the oxidation of DAMN, and little reaction of the latter was observed with montmorillonite in which the bulk of the iron was in the divalent state. The possible significance of these redox reactions to chemical evolution is discussed. C. D.

**A82-41197 The radiolysis of aqueous propionitrile - Compounds of interest to chemical evolution studies.** S. Jovanovic, V. Spinc (Institut za Nuklearne Nauke, Belgrade, Yugoslavia), S. Neskovic (Beograd, Univerzitet, Belgrade, Yugoslavia), Z. Draganic, and I. Draganic (Universidad Nacional Autónoma de México, Villa Oregón, Mexico) *Journal of Molecular Evolution*, vol. 18, July 1982, p. 337-343. 11 refs.

Oxygen-free aqueous solutions of  $CH_3CH_2CN$  (0.1 M, pH 6) were exposed to gamma rays from a Co-60 source and the mixture of radiolytic products fractionated. The separated fractions were analyzed by magnetic resonance methods (EPR, NMR), spectrophotometry (UV-VIS-IR), gas chromatography and amino acids analysis. About 70 percent of radiolytic products consist of non-volatile material. A large variety of compounds was detected: propionaldehyde, acetaldehyde, sixteen carboxylic acids and, in the hydrolysate, eleven protein and nonprotein amino acids. About 20 percent of the nonvolatile radiolytic products have a hydrophobic character and can be extracted with chloroform. Among them is a long-living nitroxide free radical which is stable for months at room temperature. It has been suggested that the nitroso compounds are formed as radiolytic products, and that they act as spin-traps by converting some of the short living radicals to the observed nitroxide radical. This and other experimental findings are discussed in the light of free radical reactions induced by ionizing radiation. (Author)

**A82-41198 A model for the origin of life.** F. J. Dyson (Institute for Advanced Study, Princeton, NJ) *Journal of Molecular Evolution*, vol. 18, July 1982, p. 344-350. 12 refs.

A simple statistical model is constructed, describing the transition from disorder to order in a population of mutually catalytic molecules undergoing random mutations. The consequences of the model are calculated, and its possible relevance to the problem of the origin of life is discussed. The main conclusion of the analysis is that the model allows populations of several thousand molecular units to make the transition from disorder to order with reasonable probability. (Author)

**A82-41199 Acceleration of HCN oligomerization by formaldehyde and related compounds - Implications for prebiotic syntheses.** A. W. Schwartz and M. Goverde (Nijmegen, Katholieke Universiteit, Nijmegen, Netherlands) *Journal of Molecular Evolution*, vol. 18, July 1982, p. 351-353. 17 refs.

Formaldehyde and other simple carbonyl compounds are known to react rapidly with HCN in aqueous solution to produce the corresponding cyanohydrin compounds. It is observed that these cyanohydrins markedly accelerate the rate of HCN oligomerization, both in homogeneous solution as well as in the frozen state. These results, for which a tentative mechanism is suggested, significantly extend the possible range of conditions for HCN oligomerization on the prebiotic earth. (Author)

**A82-41200 \* Formation of the thioester, N-acetyl, S-lactoylcysteine, by reaction of N-acetylcysteine with pyruvaldehyde in aqueous solution.** A. L. Weber (Salk Institute for Biological Studies, San Diego, CA) *Journal of Molecular Evolution*, vol. 18, July 1982, p. 354-359. 50 refs. Grant No. NSG-7627.

N-acetylcysteine reacts efficiently with pyruvaldehyde (methylglyoxal) in aqueous solution (pH 7.0) in the presence of a weak base, like imidazole or phosphate, to give the thioester, N-acetyl, S-lactoylcysteine. Reactions of 100 mM N-acetylcysteine with 14 mM, 24 mM and 41 mM pyruvaldehyde yield, respectively, 86%, 76% and 59% N-acetyl, S-lactoylcysteine based on pyruvaldehyde. The decrease in the percent yield at higher pyruvaldehyde concentrations suggests that during its formation the thioester is not only consumed by hydrolysis, but also by reaction with some substance in the pyruvaldehyde preparation. Indeed, purified N-acetyl, S-lactoylcysteine disappears much more rapidly in the presence of pyruvaldehyde than in its absence. Presumably, N-acetyl, S-lactoylcysteine synthesis occurs by rearrangement of the hemithioacetal of N-acetylcysteine and pyruvaldehyde. The significance of this pathway of thioester formation to molecular evolution is discussed. (Author)

**A82-41206 Ventilatory and heart rate responses to hypoxia and hypercapnia during sleep in adults.** L. L. Hedemark and R. S. Kronenberg

(Minnesota, University, Minneapolis, MN) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 307-312 24 refs

**A82-41207** **Altitude-induced changes in plasma thyroxine, 3,5,3 prime-triiodothyronine, and thyrotropin in rats.** J M Connors (Illinois, University, Chicago, IL) and L G Martin (Peoria School of Medicine, Peoria, IL) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 313-315 21 refs Grant No NIH-5-S01-RR-05369-12

The thyroid function of high-altitude-acclimated (6,900 m for 5 wk) and nonaltitude-acclimated control (198 m) rats was studied. After 5 wk of high-altitude exposure the plasma concentrations of both thyroxine (T4) and triiodothyronine (T3) were lower than those in control rats ( $4.7 \pm 0.3$  vs  $3.3 \pm 0.2$  micrograms/dl and  $96 \pm 5$  vs  $74 \pm 6$  ng/dl, respectively). The plasma thyrotropin (TSH) concentration was elevated in the high-altitude-acclimated rats compared with controls ( $52 \pm 4$  vs  $29 \pm 3$  micrograms/dl, respectively). Gross anatomical (thyroid wt/body wt) and histological observations of thyroid tissue were consistent with elevated plasma TSH concentrations. These results suggest that the fall in the plasma concentrations of T4 and T3 during acclimation to severe hypoxia is due to a primary block of thyroid secretion and not to a fall in plasma TSH levels (Author)

**A82-41208** **Effect of heating rate on evaporative heat loss in the microwave-exposed mouse.** C J Gordon (U.S. Environmental Protection Agency, Experimental Biology Div., Research Triangle Park, NC) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 316-323 28 refs

Mice were exposed to microwave radiation at 2 450 MHz at varying intensities and heat loads to determine if the animals thermoregulate or temperature regulate in conditions of varying heat load. The mice were exposed to whole-body doses of microwave radiation and power not reflected back was regarded as absorbed by the mouse. Incident powers of three to six watts were used, resulting in specific absorption rates of 47.4-93.4 W/kg. Deep body temperatures and the evaporated heat loss were monitored, and results demonstrated that mice thermoregulate, i.e., dissipate heat loads through evaporative heat loss at a rate which is modeled numerically. It is concluded that a significant portion of the microwave energy is deposited internally. M S K

**A82-41209 \*** **Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle.** F A Witzmann, D H Kim, and R H Fitts (Marquette University, Milwaukee, WI) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 335-345 32 refs Grant No NIH-AM-22037, Contract No NAS9-15711

Casts were placed around rat feet in plantar flexion position to immobilize the soleus muscle in a shortened position, while the other foot was fixed in dorsal flexion to set the extensor digitorum longus in a shortened position. The total muscular atrophy and contractile properties were measured at 1, 2, 4, 7, 14, 21, 28, 35, and 42 days after immobilization, with casts being replaced every two weeks. The slow twitch soleus and the fast-twitch vastus lateralis and longus muscles were excised after termination of the experiment. The muscles were then stretched and subjected to electric shock to elicit peak tetanic tension and peak tetanic tension development. Force velocity features of the three muscles were assayed in a series of afterloaded contractions and fiber lengths were measured from subsequently macerated muscle. All muscles atrophied during immobilization, reaching a new steady state by day 21. Decreases in fiber and sarcomere lengths were also observed. M S K

**A82-41210** **Pulmonary stretch receptor discharge patterns in eupnea, hypercapnia, and hypoxia.** S Iscoe (Queen's University, Kingston, Ontario, Canada) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 346-354 31 refs Research supported by the Medical Research Council of Canada

**A82-41211** **Leucine and urea metabolism in acute human cold exposure.** R D Goodenough, G T Royle, E R Nadel, M H Wolfe, and R R Wolfe (Harvard University, Massachusetts General Hospital, Shriners Burns Institute, Boston, MA, John B. Pierce Foundation, New Haven, CT) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 367-372 25 refs Grants No NIH-GM-00455-03, No NIH-GM-21700-07, No NIH-GM-007-035

Four healthy males voluntarily underwent acute cold exposure at 10°C. Metabolic rate doubled for the 100-min exposure. (1-carbon-13) leucine and (nitrogen-15) urea were used as tracers of protein metabolism via a primed constant infusion. Total and plasma transported leucine oxidation approximately doubled, but the oxidation of leucine derived from protein in the tissue where oxidation occurred ('intracellular oxidation') did not change as it did when the same subjects underwent mild exercise. Rate of appearance of urea and leucine in plasma were not significantly different between control and cold. Although the rate of protein synthesis calculated from the leucine data did not change, the rate of catabolism increased. Net protein catabolism based on the urea data agreed well with the

leucine data at rest but did not exhibit a significant increase during exposure. However, net protein catabolism based on the leucine data did increase significantly during acute cold exposure (Author)

**A82-41212** **Effect of warm-up on left ventricular response to sudden strenuous exercise.** C Foster, D S Dymond, J Carpenter, and D H Schmidt (Wisconsin, University, Mount Sinai Medical Center, Milwaukee, WI) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 380-383 22 refs

Twenty male subjects divided into groups of ten performed bicycle exercise, one group using warm-up of an incremental work-load type, to determine if left ventricular ejection fraction (LVEF) could be normalized in its response to the onset of strenuous exercise. The subjects were monitored by ECG, for blood pressure, and with radionuclide angiography, and a variance analysis for a groups-by-trial design was performed with the data. The warm-ups were found to significantly affect the left ventricular response to sudden strenuous exercise (SSE), although the responses were never normalized. The ECG data is cited to demonstrate that the lack of complete normalization is due to ischemic responses to the SSE, which may be secondary to a delay in autoregulation of coronary blood flow during SSE. M S K

**A82-41213** **Neuromuscular adaptation in human thenar muscles following strength training and immobilization.** D G Sale, A J McComas, J D MacDougall, and A R M Upton (McMaster University, Hamilton, Ontario, Canada) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 419-424 30 refs Research supported by the Muscular Dystrophy Association of Canada

The effects of strength training and limb immobilization on the human thenar muscles were investigated in 11 healthy subjects. One group (n = 6) trained prior to immobilization and a second group (n = 5) underwent immobilization prior to training. Measurements made in the control condition and following the two experimental conditions included voluntary isometric strength, motor-unit counts, motor nerve conduction velocity, reflex potentiation, and isometric twitch-contraction properties. When the results of both groups were combined an average of 5 wk of immobilization was found to cause a significant decrease in voluntary strength (42%, P less than 0.05) and reflex potentiation (37%, P less than 0.01) in relation to the control condition. Training caused an increase (40%, P less than 0.05) in voluntary strength and a decrease in twitch tension (25%, P less than 0.01) and contraction time (8%, P less than 0.05). Training prior to immobilization provided a reserve of neuromuscular function, which attenuated the effect of immobilization in relation to the control condition. It was concluded that neural as well as muscular adaptation occurred in response to immobilization (Author)

**A82-41214** **In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys.** C V Gisolfi, K Sato, P T Wall, and F Sato (Iowa, University, Iowa City, IA) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 425-431 25 refs Grant No NIH-5-R01-NS-14745-03, Contract No N00014-75-C-0597

**A82-41215** **Metabolic and cardiovascular adaptations in trained hypophysectomized rats.** J G Edwards, D D Lund, T G Bedford, C M Tipton, R D Matthes, and P G Schmid (U.S. Veterans Administration Medical Center, Iowa, University, Iowa City, IA) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 448-454 54 refs Grants No NIH-HL-21245-05, No NIH-GM-07045-04

Two groups of rats, one hypophysectomized, were exposed to progressive treadmill training for 14-17 weeks. The rats were monitored for blood pressure before training and before sacrifice, muscarinic cholinergic receptor density in the heart, and cardiovascular responses to lower body negative pressure. The hypophysectomized rats were found to have reduced maximum oxygen uptake and heart rate, both of which increased with endurance training. Blood pressure was lower before training and stayed lower in the rats with the pituitary removed, and decreases in cholinergic receptors were observed in the right atrium of the trained group. It is concluded that significant metabolic and cardiovascular adaptations occur in trained animals deprived of anterior pituitary hormones, but the exact mechanism for individual changes was not determined. M S K

**A82-41216** **Relationship between muscle QO2 and fatigue during repeated isokinetic contractions.** J L Ivy, W M Sherman, J M Miller, B D Maxwell, and D L Costill (Ball State University, Muncie, IN) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 470-474 31 refs Grant No NIH-HL-20408-02

Two biopsy samples were taken from the vastus lateralis muscles of 13 male subjects, who then performed isokinetic exercises of lifting a weight through a 90 deg arc using apparatus on a leg exercise bench. Data was gathered on thigh volumes, fatigue limits, the distribution of fast- and slow-twitch muscles in the biopsied muscles, and the muscle respiratory capacities (RC). Subjects with RC above a 2472 microliter O2/hr mean value displayed slower fatigue onset than subjects with RC values below the mean. The maximum aerobic power was

correlated with the percent of maximum power and power/ml of fat-free thigh volume. The results indicated that muscle capacity for aerobic metabolism influences the rate of fatigue development, while a correlation between fiber type and fatigue onset was not found. M S K

**A82-41217** **Protection from O<sub>2</sub> toxicity by preexposure to hypoxia - Lung antioxidant enzyme role.** L. Frank (U S Veterans Administration Hospital, Miami, University, Miami, FL) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 475-482 45 refs. Research supported by the U S Veterans Administration, Grants No NIH-HL-26029, No NIH-HL-20366, No NIH-HL-22333, No NIH-HL-07382.

Adult rats, mice, and hamsters were exposed to hypoxic conditions, examined for lung antioxidant enzyme responses to the hypoxia, and tested for tolerance in atmospheres of greater than 95% O<sub>2</sub>. The animals were initially placed in a 14% O<sub>2</sub> environment, with gradual decreases over a 24 hr interval to 10%. Comparisons were made of hypoxia preexposed animals and nonpreexposed animals in terms of lung concentrations of superoxide dismutase (SOD), Protein, and DNA, and the enzymes catalase, glutathione peroxidase, glucose-6-phosphate dehydrogenase. Statistical analyses indicated an increase in lung antioxidant enzyme activities in rats following an exposure to hypoxic conditions, resulting in a tolerance to hyperoxic atmosphere. A further test involving injection of an SOD blocker eliminated the tolerance in rats. Mice and hamsters experienced no increase in hyperoxic tolerance following hypoxic exposure. M S K

**A82-41218** **Effect of induced erythrocythemia on hypoxia tolerance during physical exercise.** R J Robertson, R Gilcher, K F Metz, G S Skinner, T G Allison, H T Bahson, R A Abbott, R Becker, and J E Falkel (Pittsburgh, University, Pittsburgh, PA) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 490-495 33 refs.

Five male mountain climbers participated in treadmill exercises after submitting to phlebotomies for the extraction of red blood cells totaling four units over a 32 wk period. The cells were frozen while the blood plasma was reinjected. The subjects were supplied with 300 mg of ferrous gluconate until reinjected with the stored red blood cells over a two-day period. The subjects then performed treadmill trials while breathing either a normoxic mixture or a hypoxic gas simulating a 3566 m altitude. Monitoring comprised heart rate, expired ventilation, ventilatory flow, respiratory rate, and breath O<sub>2</sub> and CO<sub>2</sub> content, as well as treadmill performance, hematocrit, and hemoglobin blood concentration. The induced erythrocythemia was found to increase normoxic performance by 15.8% and altitude hypoxia exercise output by 8.9%, while both conditions produced a maximal oxygen uptake increase of at least 12%. M S K

**A82-41219** **Acid-base, metabolic, and ventilatory responses to repeated bouts of exercise.** M J Buono and F B Roby (Arizona, University, Tucson, AZ) *Journal of Applied Physiology Respiratory, Environmental and Exercise Physiology*, vol 53, Aug 1982, p 436-439 28 refs.

Acid-base, metabolic, and ventilatory responses to sequences of short term, high intensity exercise were examined in ten male subjects performing at a maximal rate on a bicycle ergometer. Maximal work load levels were determined for each subject in alternating 3 min peddling, 3 min rest cycles until exhaustion. Parameters which were monitored included the O<sub>2</sub> uptake, CO<sub>2</sub> production, respiratory exchange rate, minute ventilation, heart rate, and blood pH, CO<sub>2</sub> partial pressure, and lactate content. Dual five minute maximal tests were then run with a 25 min rest between sessions. The 5 min trials revealed that a reciprocal relationship exists between the blood lactate removal rate and bicarbonate build-up during the rest period, and the second trial resulted in lower lactate levels than the first. It is concluded that a period of high intensity exercise can alter acid-base and metabolic responses in succeeding exercises. M S K

**A82-41230** **A nonlinear model combining pulmonary mechanics and gas concentration dynamics.** K R Lutch (Case Western Reserve University, Cleveland, OH), F P Primiano, Jr (Case Western Reserve University, Rainbow Babies and Children's Hospital, Cleveland, OH), and G M Sidel (Case Western Reserve University, U S Veterans Administration Medical Center, Cleveland, OH) *IEEE Transactions on Biomedical Engineering*, vol BME-29, Sept 1982, p 629-641 19 refs. Research supported by the U S Veterans Administration, Grants No NIH-HL-07414, No NIH-AM-08305.

A nonlinear mathematical model is presented which describes the functional relations between pulmonary mechanics and gas concentration dynamics during breathing at various frequencies and volume operating points. Various combinations of parameters are chosen, including cases in which the model is mechanically uniform (normal) and nonuniform (obstructive). Clinical measures of mechanical uniformity and gas concentration inhomogeneity are evaluated along with unobservable indexes. It is shown that for the nonuniform model, the gas is distributed more inhomogeneously at higher frequencies and lower lung volumes, the distribution of initial dead space gas to the compartments as well as pendelluft tend to decrease this inhomogeneity. Dynamic compliance for the nonuniform model is found to be frequency dependent at each of the three volume points investigated, whereas the semilog nitrogen washout curve is essentially linear for some frequencies and volumes and nonlinear for others. V L

**A82-41324** **Evolution of early mechanisms of translation of genetic information into polypeptides.** H Kuhn (Max-Planck-Institut für biophysikalische Chemie, Göttingen, West Germany) and J Waser *Nature*, vol 298, Aug 5, 1982, p 585, 586 11 refs.

A model for the development of enzymes from the interactions between helices of hairpin-loop adaptor RNA molecules aligned in parallel in a sequence complementarity to another messenger RNA to promote polypeptide synthesis is presented. Hydrogen bonds from between nucleotides in the hairpin loop and complementary nucleotides in an extended RNA filament, which is attached to another hairpin loop, etc., to form a picket fence arrangement. Hairpin RNAs are precursors to tRNA and the filament is a precursor to mRNA. Primeval conditions are assumed, including the presence of activated nucleotides and amino acids, the existence of periodic temperature changes, and a structurally diversified environment such as porous rocks. Aggregate groups forming in small pores could move to large pores, with growth proceedings by the linkages of the twisted hairpin loops to collector strands. M S K

**A82-41334** **† A new hypothesis for the mechanism of muscle contraction (Novaia gipoteza mekhanizma myshechnogo sokrashchenia).** N S Miroshnichenko (Kievskii Gosudarstvennyi Universitet, Kiev, Ukrainian SSR) *Akademiia Nauk SSSR, Doklady*, vol 265, no 3, 1982, p 735, 736 7 refs. In Russian.

The contraction mechanism of a cross-striated muscle is explained in terms of a new model which involves screw-like motion of a thick protofibril inside six hexagonally arranged thin protofibrils whereby the thin protofibrils are turned onto the thick protofibril in the same way as a nut onto a screw. Experimental data which support this hypothesis are briefly discussed. In particular, the proposed hypothesis accounts for the presence of two identical heads in the myosin molecule. V L

**A82-41445** **# Mode of mutual influence of stimulation-characteristics in the visual processing system (Art und Ort der gegenseitigen Beeinflussung von Reizmerkmalen in der visuellen Informationsverarbeitung - Ein empirischer Vergleich der Modelle von Estes sowie Shiffrin und Geisler).** D Lange (Braunschweig, Technische Universität, Naturwissenschaftliche Fakultät, Doktor der Naturwissenschaften Dissertation, 1980 145 p 31 refs. In German).

The results of an investigation of perceptual independence of stimulation characteristics in the human visual system are presented. The sensory models of Estes (1972) and of Shiffrin and Geisler (1973) are presented and their validity tested. The study takes into account independent variables such as similarity, separation, and position as well as dependent ones and analyzes stimulative material. The independence of the statistical findings from the independent variables is evaluated. C D

**A82-41450** **# On the observability of electrical cardiac sources.** A A H Damen (Eindhoven, Technische Hogeschool, Doctor in de technische Wetenschappen Dissertation, 1980 259 p 184 refs. Research supported by the Nederlandse Hartstichting).

The observability of electrical cardiac sources is investigated based on noninvasive measurements, focusing on the identification of pericardial potentials which can be used to formulate the fundamental field-theory constraints caused by the geometrical configuration in order to provide a proper modelling of the system. As an initial approximation of the skin potential patterns, the torso is modelled as being homogeneous, and a simple simulation of the electrical heart action is developed and analyzed experimentally. The distribution of the electrode positions on the skin is optimized by means of spherical projection methods, resulting in a balanced plot of equipotentials. Both the simulated data and the actual measurements are used to identify the corresponding sources by means of three approaches: multiple dipoles, the multipolar approach, and a singular value decomposition. Of the three models tested, only the singular value decomposition provides sufficient, unambiguous estimations of the transfer relating pericardial potentials to skin potentials. Using this approach, about 66 patterns on the pericard are obtained, which form a complete set for all possible potential distributions. In addition, the observable skin patterns are found to have a high correlation with the principal components of the measured skin potential distribution. N B

**A82-41458** **† The potential of radionuclide diagnosis of acute myocardial infarction (Vozmozhnosti radionuklidnoi diagnostiki ostrogo infarkta miokarda).** V N Zakharov, V K Sychev, N M Sukhanova, and V V Kovalev *Sovetskaya Meditsina*, no 6, 1982, p 3-6 16 refs. In Russian.

Clinical tests have been conducted to evaluate the effectiveness of Tc-99m pyrophosphate scintigraphy in diagnosing acute myocardial infarction. Results indicate that this technique is useful in complicated cases involving arrhythmias and conductivity disturbances as well as atypical infarctions with negative ECG picture. The method is found to be of particular value in diagnosing transmural and large-focus myocardial infarctions. V L

**A82-41459** **† Functional properties of T-lymphocytes in patients with acute myocardial infarction (Funktsional'nye svoistva T-limfotsitov u bol'-**



**nykh v ostrom periode infarkta miokarda).** I M Korochkin, I I Chukaeva, S S Kirzon, and I I Selivanov (I Moskovskii Meditsinskii Institut, Moscow, USSR) *Sovetskaya Meditsina*, no 6, 1982, p 6-9 11 refs In Russian

**A82-41460 † Diurnal dynamics of the indicators of the capacity for physical work and of physiological functions (Vnutrisutochnaia dinamika pokazatelei fizicheskoi rabotosposobnosti i fiziologicheskikh funktsii).** L Ia Glybin (Vladivostokskii Meditsinskii Institut, Vladivostok, USSR) *Sovetskaya Meditsina*, no 6, 1982, p 10-13 13 refs In Russian

It is pointed out that no clear notion exists of the periodicity during the day of the physiological processes that determine the time dependence of a person's capacity for work. Experiments are carried out on 111 subjects (78 men and 33 women) ranging in age from 18 to 45. Work capacity is evaluated with a dynamometer that measures the strength of a hand squeeze. Endurance is evaluated by measuring the time that a given strength of squeeze can be maintained. These indicators of the capacity for physical work are found to reach a maximum at the following times of day: 5 a.m., noon, 4 p.m., 8 p.m., and midnight. These are also the optimum times for the indicators of such physiological factors as arterial pressure, body temperature, frequency of heart contractions, frequency of respiration, breathing capacity, and time between inhalation and exhalation. C R

**A82-41461 † Dyspnea - What is it (Chto takoe odyshka).** A G Dembo (Institut Fizicheskoi Kul'tury, Leningrad, USSR) *Sovetskaya Meditsina*, no 6, 1982, p 53-56 26 refs In Russian

It is contended that subjective criteria by themselves are insufficient for a diagnosis. Individual responses may differ and a person who has become accustomed to the condition will be less sensitive to it. In some cases, however, dyspnea actually is purely subjective, there being no actual impairment of respiration, in others the condition is present without the person's awareness. Dyspnea is defined here as labored and/or altered breathing, the first being manifested through a sensation, the second through actual changes in the indicators of external respiration. In most cases, the two occur together. A distinction is drawn between physiological and pathological dyspnea. C R

**A82-41462 † Hygienic evaluation of an 8-mm-wave electromagnetic field (Gigienicheskaia otsenka elektromagnitnogo polia 8-millimetrovyykh voln).** Iu D Dumanski and L A Tomashevskaya (Kievskii Nauchno-Issledovatel'skii Institut Obshchei i Kommunal'noi Gigieny, Kiev, Ukrainian SSR) *Gigiena i Sanitariya*, June 1982, p 18-20 In Russian

A study has been carried out to investigate the effect of 8-mm-wave electromagnetic fields of 140, 100, and 60 microwatt/sq cm produced by meteorological radars on certain metabolic functions in animals. A relationship is established between metabolic disturbances, on the one hand, and the energy flux density and exposure time, on the other hand. It is recommended to use the findings of the study as the basis for hygienic regulation of electromagnetic fields in residential areas. V L

**A82-41463 † Tritium oxide distribution and excretion kinetics in the exposure of animals to noise (Raspredeleeniye i kinetika vyvedeniya oksida tritiya pri vozdeistvii shuma na organizm zhivotnykh).** M M Tsapkov and N S Kalizina *Gigiena i Sanitariya*, June 1982, p 29-31 In Russian

The effect of noise (100-103 dB, 500 Hz) on the uptake of tritium oxide in various tissues of rats, as well as the kinetics of tritium oxide excretion, is investigated. The experimental animals are intraperitoneally administered single injections of tritium oxide, and exposed to noise for three hours each day for up to 256 days, and the isotope content in the aqueous phases of the brain, lungs, muscles, skin, and blood is determined. Results show that the isotope content in all of the tissues studied is higher after 2, 4, 64, 128, and 256 days of exposure to noise than for control groups not exposed to noise. By the 256th day of exposure to noise, the levels of tritium in these organs are two to four times higher than in the corresponding organs of the control animals. In addition, the rate of isotope excretion from the aqueous phase and dry residue of the test organs is found to be slower for the experimental animals than for the control ones. N B

**A82-41464 † A hygienic evaluation of the biological effects of non-ionizing microwave radiation (K gigienicheskoi otsenke biologicheskogo deistviya neioniziruiushchikh mikrovolnovykh izlucheni).** V S Belokrinskii (Kievskii Nauchno-Issledovatel'skii Institut Obshchei i Kommunal'noi Gigieny, Kiev, Ukrainian SSR) *Gigiena i Sanitariya*, June 1982, p 32-34 7 refs In Russian

The effects of nonionizing microwave radiation of various intensities and durations are investigated for rats, dogs, and cats. Analyses of histochemical indices (such as the content of glycogen, neutral fats, nucleic acids, chromatin, and the activities of the enzymes succinic dehydrogenase, malate dehydrogenase, lactate dehydrogenase, and glucose-6-phosphate dehydrogenase) and ultrastructural changes in cells of the brain and spinal cord, heart, and kidneys show that the animals studied have a high sensitivity to microwave radiation with wavelengths of about 12.6 cm. In addition, it is determined that the changes in the histochemical indices and the ultrastructural alterations are correlated with the intensity and duration of the microwave radiation, as well as with the tissue assay

period and the specific functions of the cells studied. Attention is also given to the limits of the histochemical and structural transformations in the cells, tissues, and organs which show morphological changes under the influence of microwave radiation. N B

**A82-41465 † The assimilation of vitamin C in seamen during voyages at high latitudes (C-vitaminnaia obespechennost' organizma moriakov pri plavanii v vysokikh shirotakh).** V S Novikov and V P Petrov *Gigiena i Sanitariya*, June 1982, p 78, 79 In Russian

The tissue saturation of vitamin C in seamen is investigated, along with the effect of increased doses of ascorbic acid during voyages at high latitudes in the spring and fall. Seamen whose tissue saturation before the voyage is good or satisfactory do not suffer a decrease in the amount of vitamin C absorbed into the tissue in voyages during the spring. In the fall, the content of the vitamin in the tissues is found to fall off in proportion to the length of the voyage. Additional doses of vitamin C are recommended for voyages in the fall. The Rotter (1937) method is used for determining vitamin content. C R

**A82-41466 † The effect of the natural and climatic conditions of the Far North on the human cardiovascular system (Vlianiye prirodno-klimaticheskikh faktorov Krainego Severa na sostoianie serdechno-sosudistoi sistemy cheloveka).** I I Dedenko, B V Ustushin, B M Stolbun, and O G Novikova (Moskovskii Nauchno-Issledovatel'skii Institut Gigieny, Moscow, USSR) *Gigiena i Sanitariya*, June 1982, p 79-81 12 refs In Russian

**A82-41467 † The incorporation of P-32 into various sections of the brain upon exposure to intermittent noise of low intensity (Vklucheniye <sup>32</sup>P v razlichnye otdely golovnogo mozga pri vozdeistvii preryvistogo shuma maloi intensivnosti).** N F Svaikovskaya (Akademiya Meditsinskikh Nauk SSSR, Moscow, USSR) *Gigiena i Sanitariya*, June 1982, p 87, 88 In Russian

White male rats are subjected to intermittent noise for two hours each day for 18, 54, and 90 days. The two-hour session comprises alternating 15-minute periods of noise and silence. The intensity of the noise is 60 dB, and the frequency is in the range 50-5000 Hz. The number of sections of the brain in which an increase is observed in the coefficient of isotope accumulation and the coefficient of relative organ activity is found to depend on the total time of exposure to the noise. When P-32 is introduced before the two-hour session, a significant accumulation of the isotope is observed in various sections of the brain. The more pronounced shifts observed when the isotope is introduced before the noise are seen as suggesting that the changes occur principally through the direct action of the noise. C R

**A82-41468 † Biochemical aspects of the mechanism by which cholinolytics affect the brain (Biokhimicheskie aspekty mekhanizma deistviya kholinolitikov na mozg).** S S Krylov and E V Semenov (Ministerstvo Zdravookhraneniya SSSR, Institut Toksikologii, Leningrad, USSR) *Uspekhi Sovremennoi Biologii*, vol 93, May-June 1982, p 397-408 116 refs In Russian

It is shown that the blocking of postsynaptic choline receptors produces changes in neuromediator metabolism, ion transport, and ferment activity. It is emphasized that one of the essential factors determining the effect of cholinolytics on the presynaptic structures of the brain nerve endings is a change in the permeability of the membranes with respect to electrolytes. It is suggested that liberation and retention of neuromediators in tissue in the presence of cholinolytics and due to the effect of neuromediators and their mimetics (agonists) are largely determined by the ratio of Ca(2+) and Mg(2+). V L

**A82-41469 † Myosatellitocytes and cambial properties of skeletal and muscular tissue (Miosatellitotsity i problema kambial'nosti skeletonomyshechnoi tkani).** R K Danilov and A A Klishev (Kuibyshevskii Meditsinskii Institut, Kuibyshev, USSR) *Uspekhi Sovremennoi Biologii*, vol 93, May-June 1982, p 409-420 85 refs In Russian

**A82-41470 † The structure and function of macrophages (Struktura i funktsii makrofagov).** Iu I Afanas'ev, V I Nozdrin, M Z Bakhshinian, and V L Gorachkina (I Moskovskii Meditsinskii Institut, Moscow, USSR, Erevanskii Meditsinskii Institut, Yerevan, Armenian SSR) *Uspekhi Sovremennoi Biologii*, vol 93, May-June 1982, p 421-432 139 refs In Russian

Macrophages are defined as mononuclear myeloid cells whose cytoplasm is characterized by a moderately developed synthesizing apparatus and a well-developed complex of lysosomes. The cells typically have a well-developed periphery that provides for phagocytosis, pinocytosis, secretion, and motion. The population of macrophages is not uniform, differing in functional and morphological respects. This heterogeneity is a reflection of the different stages of the cells in the life cycle. The principal biological function of macrophages is to support, together with other cells, immune homeostasis. C R

**A82-41471 † Microcalorimetry in biomedical investigations (Mikrokolorimetriya v mediko-biologicheskikh issledovaniyakh).** A Sh Zaichik and L P Churnilov (Ministerstvo Zdravookhraneniya RSFSR, Leningradskii Pediat-

tricheskii Meditsinskii Institut, Leningrad, USSR) *Uspekhi Sovremennoi Biologii*, vol 93, May-June 1982, p 448-465 210 refs In Russian

The principles, achievements, and prospects of the biological-reaction microcalorimetry used in investigating biochemical systems, cells, organs, and immunological reactions are surveyed. Attention is given to microcalorimetric investigations on the cellular level and to the calorimetry of subcellular structures C R

**A82-41472 ↑ Optimization of medicinal electrophoresis (Voprosy optimizatsii lekarstvennogo elektroforeza).** I E Oranskii, L I Baichorova, and V S Ulashchik (Belorusskii Institut Usovshenstvovaniia Vrachei, Minsk, Belorussian SSR, Sverdlovskii Nauchno-Issledovatel'skii Institut Kurortologii i Fizioterapii, Sverdlovsk, USSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 9-12 6 refs In Russian

Methods for increasing the efficiency of medicinal electrophoresis are briefly discussed. In particular, attention is given to techniques for increasing skin permeability, the use of pulsed current (particularly, sinusoidal current), biological synchronization, and parametric optimization V L

**A82-41473 ↑ The use of an audio-frequency magnetic field in certain diseases (Primenenie magnitnogo polia zvukovogo diapazona pri nekotorykh zabolevaniakh).** A G Kakuliia, L A Abuladze, L G Glonti, M N Melikishvili, and L S Urpanishvili (Nauchno-Issledovatel'skii Institut Kurortologii i Fizioterapii, Tbilisi, Georgian SSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 18-21 In Russian

Clinical data on 60 patients suffering from obliterating atherosclerosis of the lower extremities and 30 patients with osteoarthritis deformans indicate that a course of treatment with an audio-frequency magnetic field can be effective in such cases. Apart from general clinical improvement, the treatment normalizes lipid metabolism and improves peripheral circulation and muscular function of the extremities in obliterating atherosclerosis, and normalizes the total content of chondroitin sulfate and its fractions in patients with osteoarthritis deformans V L

**A82-41474 ↑ Thermal pulsation - Techniques, demonstration, and clinical application (Teplovaia pul'satsiia - Metodiki, obosnovaniia i primeneniie v klinike).** V A Likhtenshtein (Dagestanskii Meditsinskii Institut, Makhachkala, USSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 21-25 10 refs In Russian

Devices for generating thermal pulses and techniques used in thermal pulsation therapy are briefly reviewed. Data demonstrating the clinical effectiveness of thermal pulsation applied to the nasolabial reflexogenic area are presented and physiological mechanisms underlying the effect of thermal pulsation are discussed V L

**A82-41475 ↑ Application of laser therapy to patients with osteoarthritis deformans (Primeneniie lazernoi terapii bol'nykh deformiruiushchim osteoartrózom).** I L Pshetakovskii, T V Shutova, and Z G Ostashkova (Odesskii Institut Kurortologii, Odessa, Ukrainian SSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 25-29 8 refs In Russian

Clinical and immunologic studies on patients with primary osteoarthritis deformans have shown that laser therapy employing an 8-mm, 25-mW He-Ne laser (632 A) produces clinical improvement along with favorable changes in muscular function, peripheral hemodynamics, vegetovascular reactions, and immunologic reactivity. In two thirds of the patients observed, the improvement lasted for 6-12 months following the treatment, in one third of the patients, it lasted for 13-18 months. In most cases, the therapeutic effect became particularly noticeable 1-3 months after the treatment V L

**A82-41476 ↑ The effect of ultrasound and phonophoresis of ganglioblockers on the cardiovascular system in patients with cervical osteochondrosis (Vlianiie ul'trazvuka i fonoforeza ganglioblokatorov na serdechno-sosudistuiu sistemu bol'nykh sheinyim osteokhondrozom).** D L Vashkevich (Tsentral'nyi Nauchno-Issledovatel'skii Institut Kurortologii i Fizioterapii, Moscow, USSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 29-34 6 refs In Russian

**A82-41477 ↑ Dynamics of the brain electric activity in patients with cerebral insults under the effect of muscle stimulation with sinusoidal modulated currents (Dinamika elektricheskoi aktivnosti mozga u bol'nykh s tserebral'nymi insultami pod vlianiem elektrostimulatsii myshts sinusoidal'nymi modulirovannymi tokami).** G E Bagel', S E Ginzburg, and N S Katernoga (Belorusskii Institut Usovshenstvovaniia Vrachei, Minsk, Belorussian SSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 37-40 8 refs In Russian

**A82-41478 ↑ The use of electrovacuum therapy in certain diseases of the peripheral nervous system (Primeneniie elektrovakuumnoi terapii pri nekotorykh zabolevaniakh perifericheskoi nervnoi sistemy).** L L Luts (Tar-

tuskii Gosudarstvennyi Universitet, Tartu, Estonian SSR) and E A Roode (Tartuskaia Klinicheskaiia Bol'nitsa, Tartu, Estonian SSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 40-43 7 refs In Russian

**A82-41479 ↑ Electrical stimulation of the urinary bladder following radical surgery for cancer of the rectum (Elektrostimulatsiia mochevogo puzyr'ia posle radikal'nykh operatsii po povodu raka priamoii kishki).** E V Dorogova, E L Ozhiganov, and Iu F Bagirov (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 43-46 10 refs In Russian

**A82-41480 ↑ Sources of an artificial magnetic field for implantation /experimental study/ (Istochniki iskustvennogo magnitnogo polia dlia implantatsii /eksperimental'noe issledovanie/).** A M Demetskii and G V Lud (Vitebskii Meditsinskii Institut, Vitebsk, Belorussian SSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 53-55 In Russian

The effect of the implantation of a resolving magnetic field source on blood vessels and surrounding tissue during the autoplasty of the carotid artery is studied. In experiments carried out on dogs, it is found that the resolving field source (collagen sponge) prevents activation of blood clotting. The changes that occur in the blood strengthen the body's defensive reactions C R

**A82-41481 ↑ Present-day magnetic-field sources, used in medical treatment (Sovremennye istochniki magnitnogo polia, primeniaemye dlia lecheniia).** G R Solov'eva (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Meditsinskogo Priborostroeniia, Moscow, USSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June 1982, p 62-65 20 refs In Russian

**A82-41482 ↑ A device for producing the action of static magnetic fields on biological objects (Ustroistvo dlia vozdeistviia postoiannym magnitnym polem na biologicheskie ob'ekty).** M S Golinskaia and G D Kozlov (Tsentral'nyi Nauchno-Issledovatel'skii Institut Kurortologii i Fizioterapii, Moscow, USSR) *Voprosy Kurortologii, Fizioterapii i Lechebnoi Fizicheskoi Kul'tury*, May-June, 1982, p 65, 66 In Russian

**A82-41483 ↑ The significance of postextrasystolic potentiation in the preoperative assessment of the reversal of left-ventricle asynergy in patients with ischemic heart disease (Znachenie postekstrasistolicheskogo potentsirovaniia v dooperatsionnoi otsenke obratimosti asinergii levogo zheludochka u bol'nykh ishemicheskoi bolezni'u serdtsa).** Ia E Ekha, A R Leissoo, and O A Lukha (Tartuskii Gosudarstvennyi Universitet, Tartu, Estonian SSR) *Kardiologia*, vol 22, June 1982, p 10-14 16 refs In Russian

**A82-41484 ↑ The ultrastructure of the myocardium in the restorative period following aorto-coronary shunting in patients with chronic ischemic heart disease (Ul'trastruktura miokarda v vosstanovitel'nyi period posle aortokoronarnogo shuntirovaniia u bol'nykh khronicheskoi ishemicheskoi bolezni'u serdtsa).** G D Kniazeva, G F Sheremet'eva, and A A Martynov (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Kardiologia*, vol 22, June 1982, p 18-23 14 refs In Russian

**A82-41485 ↑ A modification of Souns' method of selective coronaryography (Modifikatsiia metoda selektivnoi koronarografii po Souns).** B E Shakhov (Klinika Gospital'noi Khirurgii, Gorki, USSR) *Kardiologia*, vol 22, June 1982, p 37-40 6 refs In Russian

In contrast to Souns's original method, in the present modification the catheter is introduced through the axillary artery and the working tip of the catheter is U-shaped. These changes make the method more reliable and shorten the time of the procedure B J

**A82-41486 ↑ The amplitude of the R wave and the contractile function of the left ventricle in patients with ischemic heart disease (Amplituda zubtsa R i sokratitel'naia funktsiia levogo zheludochka u bol'nykh ishemicheskoi bolezni'u serdtsa).** N K Furkalo and M I Lutai (Ukrainskii Nauchno-Issledovatel'skii Institut Kardiologii, Kiev, Ukrainian SSR) *Kardiologia*, vol 22, June 1982, p 44-50 21 refs In Russian

**A82-41487 ↑ Immunological reactions to lipoproteins and heparin in young men with a hereditary tendency to atherosclerosis (Immunologicheskie reaktsii k lipoproteidam i geparinu u molodykh muzhchin s otlogoshchennoi po ateriosklerozu nasledstvennost'iu).** I S Golod, S S Barats, and S I Plotnikova (Sverdlovskii Meditsinskii Institut, Ministerstvo Zdravookhraneniia RSFSR, Sverdlovskii Institut Kurortologii i Fizioterapii, Sverdlovsk, USSR) *Kardiologia*, vol 22, June 1982, p 58-61 15 refs In Russian

**A82-41488 ↑ The effect of diethylamine analog of ethmazine on the functional condition of myocardium /Clinical and experimental study/**

(Vlianie dietilaminovogo analoga etmozina na funktsional'noe sostoianie miokarda /Kliniko-eksperimental'noe issledovanie/). L V Rozenshtaukh, N V Kaverina, E P Anukhovskii, S A Dremmin, G G Beloshapko, and Kh Kh Shugushev (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Kardiologiya*, vol 22, June 1982, p 72-78 23 refs In Russian

Diethylamine analog of ethmozine (DAA ethmozine) administered intravenously in doses of 0.5-1 mg/kg, which result in marked antiarrhythmic effects under both clinical and experimental conditions, is found to have little effect on arterial pressure and myocardial contractility, while producing statistically insignificant depression of the automatism of the sinus node and conductive system fibers. DAA ethmozine increased the duration of the refractory periods of the atria and atrioventricular node by 20-30%, it also increased the time of stimulation conduction at all levels of the heart conductive system. It is concluded that the drug might be effective in the treatment of cardiac arrhythmias. V L

**A82-41489 ↑** The rate of coronary perfusion as a factor determining the extent to which the contractile function of the heart is decreased in energy formation disorders (Skorost' koronarnoi perfuzii kak faktor, opredeliaushchii stepen' umen'shenia sokratitel'noi funktsii serdtsa pri narushenii energoobrazovaniia). N A Novikova, E S Solomatina, and V I Kapel'ko (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Kardiologiya*, vol 22, June 1982, p 78-82 17 refs In Russian

Experiments on the isolated hearts of guinea pigs show that administration of dinitrophenol in concentrations of 0.01-0.10 mmol produce a decrease in the pressure of a latex balloon placed into the left ventricle and an increase in the shift of the ST segment of the ECG. It is shown that the extent to which the contractile function of the heart is depressed in energy formation disorders and restored during reoxygenation is largely determined by the coronary flow rate. This effect is explained in terms of changes in the concentration of extracellular K(+) and other metabolites. V L

**A82-41490 ↑** The effect of leienkephalin and tyrosine on the lymphatic and blood microvessels (Vlianie leienkefalina i tirozina na limfaticheskie i krovenosnye mikrososudy). V K Khugaeva, V V Suchkov, and M I Titov (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Kardiologiya*, vol 22, June 1982, p 83-86 11 refs In Russian

**A82-41491 ↑** Characteristics of night sleep disorders in the case of myocardial infarction according to polygraphic data (Kharakteristika narushenii nochnogo sna pri infarkte miokarda po dannym poligrafii). K Lu Iuldashev, A R Rakhimdzhanov, B G Gafurov, and P Saidaliev (Tashkentskii Institut Uovershenstvovaniia Vrachei, Tashkent, Uzbek SSR) *Kardiologiya*, vol 22, June 1982, p 90-93 20 refs In Russian

**A82-41492 ↑** The influence of psychological and somatic factors on the symptomatology of hypertension (Vlianie psikhologicheskikh i somaticheskikh faktorov na simptomatiku gipertonicheskoi bolezni). I K Shkhat-sabaia, A P Iurenov, and T A Aivazian (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Kardiologiya*, vol 22, June 1982, p 98, 99 10 refs In Russian

**A82-41493 ↑** An evaluation of the informativeness of EKG parameters in diagnosing a myocardial infarction of the back wall of the left ventricle (Otseuka informativnosti parametrov EKG pri diagnostike infarkta miokarda zadnei stenki Levogo zheludochka). V V Shlygin and L G Aseeva (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino, USSR) *Kardiologiya*, vol 22, June 1982, p 99, 100 11 refs In Russian

**A82-41494 ↑** The use of biochemical monitoring methods in the ergometry of patients with atherosclerosis (Ispol'zovanie biokhimicheskikh metodov kontrolya pri ergometrii u bol'nykh aterosklerozom). M D Mit-senko (Dnepropetrovskii Nauchno-Issledovatel'skii Institut Vosstanovleniia i Ek-spertizy Trudospobnosti Invalidov, Dnepropetrovsk, Ukrainian SSR) *Kardiologiya*, vol 22, June 1982, p 101, 102 13 refs In Russian

**A82-41495 ↑** The tolerance to physical loads in women during menopause complicated by climacteric neurosis with cardialgia (Tolerantnost' k fizicheskoi nagruzke u zhenshchin, nakhodiashchikhsia v klimaktericheskom periode, oslozhnennom klimaktericheskimi nevrozom s kardialgiei). U Sh Ramdzhitun (Kalininskii Meditsinskii Institut, Kalinin, USSR) *Kardiologiya*, vol 22, June 1982, p 102-104 8 refs In Russian

**A82-41496 ↑** A comparison of echo- and kinetocardiographic indicators of the myocardial contractility of the left ventricle in patients suffering from various forms of ischemic heart disease (Sopostavlenie ekho- i kinetokardiograficheskikh pokazatelei sokratimosti miokarda levogo zheludochka u bol'nykh s razlichnymi formami ishemicheskoi bolezni serdtsa). N F Shmuk and A I Romanov *Kardiologiya*, vol 22, June 1982, p 101-106 10 refs In Russian

**A82-41497 ↑** Output and efficiency of the heart in young athletes as a function of the type of athletic training (Ob'em i rabotosposobnost' serdtsa u iunykh sportmenov v zavisimosti ot napravlenosti trenirovochnogo protsesssa). V I Il'inskii (Tekhnopol'skii Meditsinskii Institut, Tekhnopol, Ukrainian SSR) *Kardiologiya*, vol 22, June 1982, p 107-109 9 refs In Russian

**A82-41498 ↑** The rate at which exogenous hydrocortisone is eliminated from peripheral blood flow in patients suffering from an acute myocardial infarction (Skorost' eliminatsii ekzogenogo kortizola iz perifericheskogo krovoteka u bol'nykh ostrym infarktom miokarda). V N Shershnev, A D Kuimov, V A Milaeva, V Lu Darianin, M S Nabiulin, and A N Pugina (Novosibirskii Meditsinskii Institut, Novosibirsk, USSR) *Kardiologiya*, vol 22, June 1982, p 109, 110 10 refs In Russian

**A82-41499 ↑** The role of the energy transport system in changes of the contractile function of the heart in the case of the measured limitation of coronary blood flow (Rol'sistemy transporta energii v izmenenii sokratitel'noi funktsii serdtsa pri dozirovannom ogranichenii koronarnogo krovoteka). R A Frolik, G S Voronkov, and N N Orlova (Ukrainskii Nauchno-Issledovatel'skii Institut Kardiologii, Kiev, Ukrainian SSR) *Kardiologiya*, vol 22, June 1982, p 111-113 7 refs In Russian

Experimental results are presented on the relationship between the characteristics of the heart's contractile function and changes of energy-transport indices in the case of measured limitation of the coronary blood flow to 70 and 90%. It is shown that changes in the makeup and activity of individual components of the energy-transport system play a considerable role in the formation of pathological and compensatory shifts in the contractile function of the damaged and conditionally intact myocardium in the early period of the partial limitation of coronary blood flow. B J

**A82-41500 ↑** Functional condition of the heart mitochondria in the dynamics of emotional and pain stress (Funktsional'noe sostoianie mitokhondrii serdtsa v dinamike emotsional'no-bolevogo stressa). V V Malyshov, V I Lifant'ev, and V Z Meerson (Irkutskii Meditsinskii Institut, Irkutsk, Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) *Kardiologiya*, vol 22, June 1982, p 113-115 6 refs In Russian

Experiments were performed on male albino rats to study the effect of emotional and pain stress on heart mitochondria. It is shown that this type of stress is accompanied by considerable disruptions of the energy metabolism in the heart mitochondria, preceding the development of necrotic changes in the myocardium. These disruptions are most marked during the formation of deep contracture disorders and necrosis in the myocardium. B J

**A82-41501 ↑** The achievements of investigations carried out in the years 1976-1980 on the problem of insufficient blood circulation and heart rhythm disturbances (Itogi nauchnykh issledovaniy po probleme 'nedostatochnost' krovoobrashcheniia i narusheniia ritma serdtsa' za 1976-1980 gg). N N Mukharlamov and T Lu Shvab *Kardiologiya*, vol 22, June 1982, p 120-125 In Russian

**A82-41502 ↑** Problems in the metrology of the training load of ski racers (Voprosy metrologii trenirovochnoi nagruzki lyzhnika-gonshchika). N I Semenov and A G Shriaev (Gosudarstvennyi Institut Fizicheskoi Kul'tury, Leningrad, USSR) *Teoriia i Praktika Fizicheskoi Kul'tury*, June 1982, p 13-16 11 refs In Russian

A special endurance coefficient (SEC) is developed as a criterion for the preparedness of ski racers. It is shown that individual indices of the magnitude and intensity of the training load are invalid as criteria for determining preparedness. A method involving the search for a maximal correlation is recommended as a mathematical procedure for the processing of data on ski-racer performance. B J

**A82-41503 ↑** Optimizing conditions for athletic activity with an allowance made for neurodynamic peculiarities /using bicycle sports as a model/ (Optimizatsiia uslovii sportivnoi deiatel'nosti s ucheto m neirodinamicheskikh osobennostei sportsmenov /na modeli velosporta/). G G Illarionov (Chuvashskii Gosudarstvennyi Pedagogicheskii Institut, Cheboksary, USSR) *Teoriia i Praktika Fizicheskoi Kul'tury*, June 1982, p 19-21 14 refs In Russian

**A82-41504 ↑** The influence of a deficit of vitamins on immunity /A review of the literature/ (Vlianie defitsita vitaminov na immunitet /Obzor literatury/). I D Surkina (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, USSR) and G Mateev (Vysshii Institut Fizicheskoi Kul'tury, Sofia, Bulgaria) *Teoriia i Praktika Fizicheskoi Kul'tury*, June 1982, p 22-25 76 refs In Russian

**A82-41505 ↑** The speed of blood flow in athletes subjected to the combined action of a training regime and high-altitude climatic factors

(Skorost' krovotoka u sportstmenov pri sovmestnom vozdelstvii vysotno-klimaticheskikh faktorov i trenirovochnykh nagruzok). In M Pogosian, V G Meloian, G L Muradian, A A Chatinian, and G A Akopian (Armenian Gosudarstvennyi Institut Fizicheskoi Kul'tury, Armenian SSR) *Teoria i Praktika Fizicheskoi Kul'tury*, June 1982, p 30, 31 12 refs In Russian

**A82-41506 †** Certain psychological and tactical aspects of athlete activities during competitions (Nekotorye psikhologicheskie i takticheskie osobennosti sorevnovatel'noi deiatel'nosti sportstmenov). V S Keller (Lvovskii Gosudarstvennyi Institut Fizicheskoi Kul'tury, Lvov, Ukrainian SSR) *Teoria i Praktika Fizicheskoi Kul'tury*, June 1982, p 47, 48 In Russian

**A82-41548 \*** Skeletal abnormalities in rats induced by simulated weightlessness. T J Wronski and E R Morey (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, CA) *Metabolic Bone Disease and Related Research*, vol 4, 1982, p 69-75 41 refs

A hypokinetic model has been developed which attempts to simulate the weightlessness experienced during space flight. Male rats were suspended from the model with a head-down tilt for a two-week period. Total mechanical unloading of the hind limbs and partial unloading of the fore limbs occurred. In comparison to pair-fed control rats, the skeletal alterations in the proximal tibial and humeral metaphyses of suspended rats were determined to be a diminished rate of longitudinal bone growth, a reduced mass of mineralized tissue, and an accumulation of marrow fat. Also, suspended rats exhibited decreased numbers of osteoblasts and increased numbers of osteoclasts immediately adjacent to the growth plate-metaphyseal junction at both skeletal sites. Although the reduction in mineralized tissue and the fat accumulation were more marked in the tibia, the skeletal changes in the proximal tibial and humeral metaphyses were generally comparable. The observed abnormalities may be due to mechanical unloading and/or a hypersecretion of corticosteroids (Author)

**A82-41551 \*** Telemetry methods for monitoring physiological parameters. T B Fryer and H Sandler (NASA, Ames Research Center, Moffett Field, CA) In *Hypertension research, Methods and models*. New York, Marcel Dekker, Inc., 1982, p 45-82 73 refs

The use of telemetry to monitor various physiological functions is discussed. The advantages of the technique and the parameters that it can monitor are assessed, and the main telemetry systems, including pressure telemetry, flow telemetry, and multichannel telemetry, are detailed. Human applications of implanted flow transducers, total implant versus backpack telemetry, the use of power sources and integrated circuits in telemetry, and the future prospects of the technique in hypertension treatment and research are discussed. C D

**Page Intentionally Left Blank**



## STAR ENTRIES

**N82-28945#** Letterman Army Inst of Research, San Francisco, Calif

**DOMESTIC SWINE IN PHYSIOLOGICAL RESEARCH 3 BLOOD GAS AND ACID-BASE VALUES OF ARTERIAL AND VENOUS BLOOD FROM YOUNG ANESTHETIZED PIGS MAINTAINED UNDER STEADY-STATE VENTILATORY CONDITIONS Interim Report, Jun - Dec 1981**

John P Hannon and William Y Moores Feb 1982 35 p refs

(DA Proj 3M1-61102-BS-10)

(AD-A111834 LAIR-113) Avail NTIS HC A03/MF A01 CSCL 06/16

The arterial and venous blood gas and acid-base characteristics of anesthetized young domestic swine were determined under steady-state ventilatory conditions designed to establish arterial P O<sub>2</sub> at 100 torr and pH at 7.40 Under these circumstances, mean (N=15) femoral artery values were P O<sub>2</sub>, 97 torr, S O<sub>2</sub> 94% C O<sub>2</sub> 15.4 ml/dl pH 7.399 P CO<sub>2</sub>, 47 torr (HCO<sub>3</sub>), 27.6 mEq/l and (B E), 2.8 mEq/l Values for pulmonary artery, mixed venous blood were P O<sub>2</sub> 36 torr, SaO<sub>2</sub> 51% C O<sub>2</sub>, 8.5 ml/dl, pH, 7.335 P CO<sub>2</sub>, 57 torr (HCO<sub>3</sub>) 29.6 mEq/l and (B E) 3.9 mEq/l Comparisons of venous values obtained from various vascular sites (pulmonary artery, anterior vena cava, posterior vena cava, internal jugular vein, femoral vein and coronary sinus) revealed numerous between-vessel differences in blood gas and acid-base status The arterial characteristics of this anesthetized preparation differed from those of the conscious pig, the anesthetized animal had lower pH, (HCO<sub>3</sub>) and (B E) values and higher P O<sub>2</sub> and P CO<sub>2</sub> values than the conscious animal Anesthesia with mechanical ventilation appeared to produce defects in alveolar-arterial gas exchange similar to those reported for other species The anesthetized pig, nevertheless, can serve as an effective biomedical model for human oriented research Author (GRA)

**N82-28946#** Letterman Army Inst of Research San Francisco Calif

**LONG-TERM AND PROGRESSIVE CHANGES IN RHESUS SPECTRAL SENSITIVITY AFTER LOW-LEVEL COHERENT LIGHT (514nm EXPOSURE) Technical Note, 1978 - 1980**

Harry Zwick Edwin S Bratice and Thomas A Garcia Dec 1981 17 p refs

(AD-A111639 LAIR-81-19TN)

Avail NTIS HC A02/MF A01 CSCL 06/18

Although present laser safety standards are based on an adequate data base for acute viewing situations, they are limited in predicting the type of change in visual function that might be induced from prolonged or repetitive viewing of laser sources Viewing requirements in holography laser display systems and in general, repeated exposure to low levels of laser radiation require a more complete data base for optimizing the environmental protection of individuals who will be required to work in such environments In these studies, we have simulated very low-level radiation environments and determined the effects of repetitive prolonged exposure on the visual function of the of the Rhesus Our data suggest that prolonged viewing of such sources, even though they are well below present laser safety standards, can produce permanent changes in visual processes that underline normal human day (photopic) and night (scotopic) vision Studies of morphology have shown possible subtle morphological correlate The coherency of laser light is implicated as a significant factor in inducing these effects It is recommended that individuals required to work in these situations be frequently evaluated for changes in visual function by presently available clinical instruments for assessment of visual function Further confirmation of these studies will determine the impact of these research findings on present laser safety standards GRA

**N82-28947#** Puerto Rico Univ, Mayaguez Center for Energy and Environment Research

**OTEC BIOFOULING, CORROSION, AND MATERIALS STUDY FROM A MOORED PLATFORM AT PUNTA TUNA, PUERTO RICO**

D S Sasscer, T R Tosteson and T O Morgan Aug 1981 126 p refs Prepared for ANL, Ill

(Contract W-31-109-eng-38)

(DE82-007037 ANL/OTEC-BCM-023)

Avail NTIS

HC A07/MF A01

A biofouling test of periodically cleaned OTEC evaporator tubes was conducted The fouling resistance, total surface carbon and nitrogen content, ATP, and the wet film thickness (WFT) were determined throughout the test Visual observations of the fouling film were made by light sectioning and scanning microscopy, and at the end of the test, a study was made of the macrofouling of the flow system The results of the tests indicate that a base layer of bacteria and exudated polysaccharides enhance microbial adhesion and thereby create an environment conducive to rapid film growth Fouling rates for aluminum were generally higher than for titanium but they were linear for both materials Excellent correlation was found to exist between R/sub f and WFT which supports the hypothesis that it is the stagnant film of water entrapped by bacteria which is largely responsible for the insulating properties of the biofilm The macrofouling study identified 61 species of benthic invertebrates representing ten phyla growing in those parts of the flow system where flow was less than 3 fps but no macrofouling where the flow velocity significantly exceeded 3 fps DOE

**N82-28948#** National Inst for Metallurgy Randburg (South Africa)

**THE ORGANIZING OF CONFERENCES**

L F Haughton 18 Sep 1981 18 p refs

(PB82-142696, NIM-2130 ISBN-0-86999-556-1) Avail

NTIS HC A02/MF A01 CSCL 05A

The Liaison and Information Division of the National Institute for Metallurgy (NIM) has been concerned in the planning and organizing of conferences, local and international, large and small, for many years, and as the result of trial and error has acquired a fair amount of knowledge of the subject and developed a successful modus operandi It is felt that the knowledge and expertise gleaned over the years should be made available generally for use by interested organizers GRA

**N82-28949#** Joint Publications Research Service, Arlington, Va

**USSR REPORT. SPACE BIOLOGY AND AEROSPACE MEDICINE, VOLUME 16, NO 3, MAY - JUNE 1982**

O G Gazenko ed 2 Jul 1982 155 p refs Transl into ENGLISH of Kosm Biol Aviakosmicheskaya Med (USSR), 1982

(JPRS-81197) Avail NTIS HC A08

The effects of weightlessness and acceleration on the physiology of man were studied The heart was studied in relation to the effects of long term spaceflight circadian rhythms, and external conditions Different aspects of blood circulation and motion sickness were studied For individual titles, see N82-28950 through N82-28976

**N82-28950#** Joint Publications Research Service, Arlington, Va

**PROBLEM OF ACCELERATIONS IN AVIATION MEDICINE**

P V Vasilyev and S A Gozulov In its USSR Rept Space Biol and Aerospace Med, V 16 No 3 May - Jun 1982 2 Jul 1982 p 1-6 (JPRS 81197) refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR) v 16, no 3, May - Jun 1982 p 4-7

Avail NTIS HC A08

The problem of effects of accelerations on an organism, particularly on a pilot's work capacity is discussed Further increase in the body's resistance to accelerations and consequently, increase of pilot's work capacity are emphasized The increasing diversity of inflight tasks and complexity of interaction in the pilot-aircraft-environment system make it imperative to examine many physiological questions from the standpoint of the systems approach and with consideration of ergonomic aspects of this problem The accelerations inherent in aircraft flights are divided into two main types prolonged (piloting), which occur when

maneuvering the aircraft, and impact, which occur during ejection, opening of the parachute, landing of the pilot, as well as forced ('rough') landings of the aircraft. The effects of these accelerations on pilots differ appreciably S L

**N82-28951#** Joint Publications Research Service, Arlington, Va

**SLEEP, CIRCADIAN CYCLES OF PHYSIOLOGICAL FUNCTIONS AND PARAMETERS OF HUMAN WORK CAPACITY ON FIRST DAY AFTER CHANGING FROM ALTERED TO USUAL SLEEP-WAKING CYCLE**

A N Litsov *In its* USSR Rept Space Biol and Aerospace Med V 16, No 3 May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 7-14 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 8-13

Avail NTIS HC A08

Twelve male test subjects, aged 28 to 40 took part in studies, in which a normal work-rest cycle was preceded by three types of an altered cycle, to investigate their adaptation reactions. The return to the normal work-rest cycle was accompanied by slight changes in physiological functions, work capacity and sleep patterns. The level of these changes was correlated with the type of altered work-rest cycles and with the degree of men's adaptation to them. The return to the normal work-rest cycle proceeded more readily, if adaptation to an altered cycle was incomplete. The required level of work capacity of men that have to vary their work-rest cycles frequently can be maintained by short term (for 1 to 3 days) cycle alterations S L

**N82-28952#** Joint Publications Research Service, Arlington, Va

**ROLE OF HORMONAL COMPOUNDS IN REGULATION OF ELECTROLYTE METABOLISM IN THE PRESENCE OF EMOTIONAL STRESS**

B B Afonin, L L Orlov, N F Kalita, T A Viting, and R A Tigranyan *In its* USSR Rept Space Biol and Aerospace Med, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 15-19 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 13-16

Avail NTIS HC A08

The emotional stress simulated by examinations taken by medical students led to a decrease of sodium concentration in blood. A simultaneous increase of mineralocorticoids and a decrease of glucocorticoids was responsible for the sodium concentration in the blood. Both inhibition of glucocorticoids and stimulation of mineralocorticoids were associated with a high activity of plasma renin and a low concentration of adrenocorticotrophic hormone S L

**N82-28953#** Joint Publications Research Service, Arlington, Va

**METABOLIC DISTINCTIONS RELATED TO INTAKE OF LOW-CALORIE 'SURVIVAL' RATIONS CONSISTING ONLY OF READILY ASSIMILATED CARBOHYDRATES**

I G Popov, P A Lozinskiy, A A Latskevich, and I A Romanova *In its* USSR Rept Space Biol and Aerospace Med, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 20-31 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 16-25

Avail NTIS HC A08

Carbohydrate, mineral, amino acid, nitrogen metabolism, nutritional status and general health condition of test subjects were studied in the case of an emergency landing in an area with a temperate climate, a contingency diet consisting of 300 g of readily assimilable disaccharides can be consumed for 5 days S L

**N82-28954#** Joint Publications Research Service, Arlington, Va

**DYNAMICS OF LEFT VENTRICULAR SYSTOLIC PHASE STRUCTURE DURING LONG-TERM (140-185 DAYS) SPACEFLIGHTS**

A P Polyakova, A D Yegorov, and I V Alferova *In its* USSR Rept Space Biol and Aerospace Med, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 32-38 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 25-30

Avail NTIS HC A08

Kinetocardiographic studies of the left ventricular systolic time intervals at rest in spaceflights of 140, 175, and 185 days in duration revealed functional changes reflecting cardiovascular adaptation to weightlessness. The typical changes were shortening of isometric contraction, decrease of the tension index, irregular decline of the ejection time, and a slight increase in the intrasystolic index. These changes in the systolic time intervals are indicative of an enhanced strength of cardiac contraction. This may in turn be associated with cephalad fluid shifts and reduced activity of the peripheral muscular heart S L

**N82-28955#** Joint Publications Research Service, Arlington, Va

**SLOW WAVES OF CARDIAC RHYTHM IN HEALTHY MAN UNDER DIFFERENT CONDITIONS**

A N Karpov and L A Zinovyeva *In its* USSR Rept Space Biol and Aerospace Med, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 39-42 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 30-32

Avail NTIS HC A08

The slow waves of the cardiac rhythm were investigated at rest and under emotional and physical stress. In most test subjects emotional stress led to the generation of the first order slow waves of 0.04-0.09 cps, whereas exercises inhibited slow waves of the above frequency range. Heart rate increased in response to both emotional and physical stress. The slow wave responses are used to evaluate the emotional status and to differentiate emotional and physical stress S L

**N82-28956#** Joint Publications Research Service, Arlington, Va

**SYNCHRONIZATION OF CARDIOVASCULAR ACCIDENTS WITH PHYSICAL CLOCKS**

R M Arslanova, V N Benevolenskiy, N G Ptitsyna, and K A Trukhanov *In its* USSR Rept Space Biol and Aerospace Med, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 43-47 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 32-34

Avail NTIS HC A08

The frequency of cardiovascular catastrophes (daily mortality rate of patients with ischemic heart disease), heliogeomagnetic activity (solar radiation in the wave band 10.7 cm, H, D and Z components of the geomagnetic field), synchronization and desynchronization of circaseptidian rhythms, and total number of cardiovascular catastrophes in different seasons are correlated. The raw data sets were treated with due account of the discrete pattern of random sequences and noise in the medical data set. Finite analysis interval and informativity of the derivatives of the parameters used. The occurrence of cardiovascular catastrophes showed circaseptidian rhythms whose level depend on the above three factors. The results obtained are discussed with respect to possible synchronization and desynchronization of endogenous biorhythms by time cues, relating them to the mechanism of human adaptation to the environment S L

**N82-28957#** Joint Publications Research Service, Arlington, Va

**REGULATION OF CEREBRAL CIRCULATION IN ERECT POSITION**

V S Shubin, V L Anzimirov, Ya K Gasanov, and V N Korniyenko *In its* USSR Rept Space Biol and Aerospace Med, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 48-55 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 35-40

Avail NTIS HC A08

The functional mechanisms responsible for orthostatic tolerance of cerebral circulation in the normal man and in ambulatory and bedridden neurosurgical patients were investigated, using the following methods: cerebral serial angiography, measurement of cerebral blood flow by means of xenon 133 clearance, measurement of brain perfusion pressure, ventricular pressure, acid base equilibrium in the blood flowing in and out of the brain, determination of cardiac output and stroke volume, electroencephalography, and rheography of cerebral and peripheral vessels. In the normal men and patients with compensated neurosurgical pathologies, the transfer into the head up position

induced small changes in the systemic and cerebral regional circulation. This was associated with complex reactions of the vascular system triggered by the receptors of the sinocarotid area  
S L

**N82-28958#** Joint Publications Research Service, Arlington, Va

**ENDURANCE OF  $\pm 3$  G FORCES BY MIDDLE-AGED PEOPLE BEFORE AND AFTER 7-DAY IMMERSION**

A R Kotovskaya, I F VilVilyams, V I Zborovskaya, V G Andreyeva, O L Golovkina, T N Krupina, Kh Kh Yarullin, and N P Artamonova *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS 81197) 2 Jul 1982 p 56-60 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 40-43

Avail NTIS HC A08

Before and after 7 day immersion G sub z for 60 sec in a centrifuge with an arm of 7.25 m. The runs were repeated 12 times. The test subjects tolerated the exposure before and after immersion. However, after immersion the physiological systems functioned in a more stressful manner than prior to immersion. This is attributed to the deconditioning caused by simulated weightlessness. The comparison of the experimental findings with the literature data gives evidence that the pattern and level of physiological changes induced by an exposure to  $\pm 3$  G sub z for 60 sec in the test subjects, aged 41 to 49, do not differ significantly from those in younger (aged 23 to 36) people  
S L

**N82-28959#** Joint Publications Research Service, Arlington, Va

**HUMAN EXTERNAL RESPIRATION AND GAS EXCHANGE IN ACUTE PERIOD OF ADAPTATION TO IMMERSION IN WATER**

O L Golovkina *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS 81197) 2 Jul 1982 p 61-65 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 43-46

Avail NTIS HC A08

Responses of respiration and gas exchange of 6 test subjects to 3-day dry immersion were investigated. It was found that an exposure to immersion was accompanied by decreases in respiratory volume, vital lung capacity, maximum pulmonary ventilation, and breathing time retention during inhalation and expiration. These changes were paralleled by an increase in the portion of the functional dead space and a decrease in the portion of the efficient alveolar volume. The permeability of respiratory tracts remained unchanged. These changes seem to be of the type of total respiratory insufficiency induced by circulatory disorders. This may be one of the factors responsible for a decline in human tolerance to exercises and acceleration applied after an exposure to simulated weightlessness. Author

**N82-28960#** Joint Publications Research Service, Arlington, Va

**REACTION TO DIMINISHED CIRCULATING BLOOD VOLUME IN INDIVIDUALS WHO ARE SUSCEPTIBLE AND INSUSCEPTIBLE TO MOTION SICKNESS (SEASICKNESS)**

V G Isupov, D G Maksimov, and B I Polyakov *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 66-70 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16 no 3, May - Jun 1982 p 46-49

Avail NTIS HC A08

The study of 54 healthy male test subjects demonstrated significantly different responses of motion sickness susceptible and resistant people to 10 minute occlusion of their femoral veins. The changes in limb rheograms, as well as heart rate and stroke volume indicated that in motion sickness susceptible subjects the circulating blood volume in the upper body decreased, whereas in motion sickness resistant subjects it remained unaltered or increased in response to the occlusion. Author

**N82-28961#** Joint Publications Research Service, Arlington, Va

**EFFICACY OF KAVINTON IN PREVENTION OF MOTION SICKNESS**

D Bodo, A R Kotovskaya, R R Galle, L N Gavrilova, G A Gusakova and V A Smirnov *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 71-74 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16 no 3, May - Jun 1982 p 49-51

Avail NTIS HC A08

During the study 8 motion sickness susceptible test subjects were kept in a chamber rotating at a rate of 6 rpm for 5 hours. The effectiveness of the drug taken regularly during the exposure was compared with that of scopolamine and placebo taken as a single dose. The results obtained are suggestive of a positive effect of kavinton as an antinotion drug. T M

**N82-28962#** Joint Publications Research Service, Arlington, Va

**NYSTAGMOMETRY OF OPTOVESTIBULAR INTERACTION**

M M Levashov and A I Tumakov *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS 81197) 2 Jul 1982 p 75-80 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 51-55

Avail NTIS HC A08

Nystagmograms recorded in healthy people (270 ENG from 30 children aged 3 to 7) were analyzed quantitatively. The velocity of the slow component of the vestibular nystagmus during caloric tests, optokinetic nystagmus in response to stimuli applied at 20 and 10 deg/sec, as well as vestibulo-optokinetic nystagmus resulting from modulation of the optokinetic nystagmus due to the inhibitory or enhancing effect of caloric stimulation, were measured. The modulation level, i.e., the change of the velocity of the slow component that accompanied the transition of the optokinetic nystagmus to the vestibulo-optokinetic nystagmus, was always less than that of the vestibular nystagmus. This disagrees with the concept about algebraic summation of intensities of the reactions. The modulation level showed a low correlation with the vestibular nystagmus slow component velocity and depended on the optokinetic nystagmus velocity. Author

**N82-28963#** Joint Publications Research Service, Arlington, Va

**EFFECT OF CALORIC STIMULATION OF VESTIBULAR SYSTEM ON HEARING**

G P Tsurikova *In its USSR Rept Space Biol and Aerospace Med*, V 16 No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 81-86 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16 no 3, May - Jun 1982 p 55-58

Avail NTIS HC A08

Changes of bone-conduction thresholds for tonal signals (250 and 2000 Hz) in each ear due to caloric vestibular tests were studied in 60 healthy test subjects (32 men and 28 women). These changes were found in 48 subjects. In most cases perceptual thresholds decreased (by 7.3 dB on the average) and in few cases increased (by 8.3 dB on the average). The sign of alteration was independent of the tonal signal frequency or the side exposed to the vestibular test or the number of examinations. The threshold returned to the norm for a long time (30 min or more). These findings suggest that the interaction may be governed by the principles that function in other sensory systems. It is recommended to carry out audiological examinations prior to vestibular tests in order to avoid distortions of the results. Author

**N82-28964#** Joint Publications Research Service, Arlington, Va

**POSSIBLE IMPAIRMENT OF RESPIRATORY REGULATION UNDER HYPERBARIC NITROGEN NARCOSIS**

L A Bryantseva, A V Suvorov and I S Breslav *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3 May - Jun 1982 (JPRS 81197) 2 Jul 1982 p 87-90 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16 no 3, May - Jun 1982 p 59-61

Avail NTIS HC A08

Nitrogen narcosis was simulated by nitrous oxide. The ventilation increment was measured as a function of an increase of the hypercapnic stimulus. A combination of high degree of hypercapnia and the narcotic effect may lead to ventilation inhibition and respiration disturbance. T M

**N82-28965#** Joint Publications Research Service, Arlington, Va

**MITOTIC ACTIVITY AND VOLUME OF EPITHELIAL CELL NUCLEI OF RAT CORNEA FOLLOWING SPACEFLIGHTS IN BIOSATELLITES**

F V Sushkov, S V Rudneva, N G Sepetova and Z Ye Vnukova *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 91-98 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR) v 16, no 3, May - Jun 1982 p 61-66

Avail NTIS HC A08

The following parameters of the epithelial mitosis were studied: mitotic index, ratio of mitotic phases, number of abnormalities of cell division, and number of chromosome aberrations in anaphases. These parameters are considered to be indicators of physiological regeneration. The nuclear volume of cells of two inner epithelial layers was measured, using a modified karyometric technique that yielded representative data. The lack of significant changes in the above mitotic parameters can be attributed either to the absence of a strong stress-reaction of rats postflight or to the discrepancy between the time of animal sacrifice and the time of the maximum post-stressor inhibition of mitotic activity. T M

**N82-28966#** Joint Publications Research Service, Arlington, Va

**CATECHOLAMINES AND ENZYMES OF THEIR METABOLISM IN RAT MYOCARDIUM AFTER FLIGHT ABOARD THE COSMOS-936 BIOSATELLITE**

R Kwetnianski, R A Tigranyan, and T Torda *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS 81197) 2 Jul 1982 p 99-102 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 66-68

Avail NTIS HC A08

In the myocardium of the weightless and centrifuged rats flown for 185 days onboard the biosatellite Cosmos-936 the catecholamine concentration and activity of enzymes involved in their synthesis and degradation, dopamine-beta-hydroxylase, monoamine oxidase and catechol-O-methyl transferase, were measured. The catecholamine concentration in the myocardium of both flight groups significantly increased, and the enzyme activity did not change. These results suggest that an exposure to space flight increases the catecholamine concentration and exerts no effect on their synthesis and degradation in the rat myocardium. Author

**N82-28967#** Joint Publications Research Service, Arlington, Va

**NITROGEN COMPOUND LEVELS IN TISSUES OF RAT CEREBRAL HEMISPHERES AND CEREBELLUM AFTER FLIGHT ABOARD COSMOS-1129 BIOSATELLITE**

L M Kurkina and R A Tigranyan *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS 81197) 2 Jul 1982 p 103-106 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR) v 16, no 3, May - Jun 1982 p 68-70

Avail NTIS HC A08

The content of ammonia, glutamine, urea, glutamic acid, aspartic acid and GABA was measured to study nitrogen metabolism. Soon after recovery (6-10 hours after recovery) the content of the above compounds in brain tissues increased except for GABA whose content decreased. Similar but more marked changes were seen in the brain of control rats exposed to a repeated immobilization stress-effect. These changes were still greater in the flight rats exposed to a repeated immobilization stress-effect postflight. It is suggested that the postflight changes of the above parameters of nitrogen metabolism are induced by stress-agents inherent in space flight and recovery. Author

**N82-28969#** Joint Publications Research Service, Arlington, Va

**CONDITION OF RATS CONNECTIVE TISSUE DURING LONG-TERM HYPOKINESIA AND IN RECOVERY PERIOD**

P P Potapov *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 112-116 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16 no 3 May - Jun

1982 p 73-76

Avail NTIS HC A08

Changes in the content of collagen in hydroxyproline, total aminopolysaccharides hexosamines, and acid glycosaminoglycans in hexuronic acids in the skin and tendons of white rats were determined on the 15, 30 and 19th hypokinetic days and on the 15, 30 and 90th days of posthypokinesia recovery. It was found that the hydroxyproline content in the skin and tendons did not change, the content of hexosamines and hexuronic acid decreased in tendons on hypokinetic days 15 and 90 and in the skin on day 15. The content of hexosamines in the skin increased on day 90. The content of hexosamines and hexuronic acids in the skin and tendons increased on recovery day 15 and remained unaltered on day 90. E A K

**N82-28970#** Joint Publications Research Service, Arlington, Va

**OSTEOPOROSIS IN UNSUPPORTED EXTREMITIES**

A I Volozhin, G P Stupakov, A N Polyakov, S M Remizov, N N Pavlova and I Ye Didenko *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 117-125 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 76-82

Avail NTIS HC A08

Dystrophic changes in bone tissue classified as osteoporosis, were demonstrated under the influence of spaceflight factors and model experiments where the bearing function of bones was eliminated. The lower part of the right extremities was amputated in dogs thus generating a support free state of the femur. On day 90 after the amputation bone resorption reached a high level and by the end of the year declined. The mature bone microstructures showed a higher degree of mineralization, whereas the young bone microstructures which were in predominance in the support free femur displayed a lower degree of mineralization. In bone, the content of Ca decreased, that of K increased, while the content of Na and P remained unchanged. It is concluded that the development of osteoporosis in the support free femur does not involve only quantitative variations in the mineral components. E A K

**N82-28971#** Joint Publications Research Service, Arlington, Va

**PREPARATION OF LABYRINTHECTOMIZED ANIMALS FOR FLIGHT ABOARD COSMOS-936 BIOSATELLITE**

A R Kotovskaya, Ye A Savina, A V Mokrousova, Ye I Alekseev, A S Markin, V F Anichin, A A Shipov, and G S Ayzikov *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS 81197) 2 Jul 1982 p 126-131 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3, May - Jun 1982 p 83-86

Avail NTIS HC A08

Labyrinthectomized animals (LA) were tested aboard the Cosmos 936 biosatellite. It was assumed that examination of LA after the space flight would make it possible to assess the role of the vestibular system in the complex reactions to long term weightlessness. It is found that LA endure weightlessness more calmly and easily than anticipated. Preparation of LA for the space flight included problems like refining of the technique and performing effective labyrinthectomy on animals, monitor their condition in the postoperative period. E A K

**N82-28972#** Joint Publications Research Service, Arlington, Va

**METHODOLOGICAL ASPECTS OF TESTING ERYTHROCYTE BALANCE BY COUNTING INCUBATED RETICULOCYTES**

A V Llykhin, T Ye Burkovakaya, A V Shafirkin, and N V Klyuchanskaya *In its USSR Rept Space Biol and Aerospace Med*, V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 132-136 refs Transl into ENGLISH from Kosm Biol Aviakosmicheskaya Med (USSR), v 16, no 3 May - Jun 1982 p 86-88

Avail NTIS HC A08

The mechanisms causing erythrocyte deficiency are discussed. The correlations between cytokinetic parameters of erythrocyte balance was investigated to assess functional activity.

reserve potential and mechanisms of development of various disturbances in the erythron system. Quantitative evaluation of erythrocyte balance are made by cytokinetic methods for examining erythropoiesis and dieresis. Techniques involving intravital labeling of erythrocytes with radioactive isotopes are reliable but not indifferent to the body. It is found that determination of erythrocyte life span by *in vitro* maturation rate of reticulocytes is least disturbing to the patient and suitable for space research purposes. E A K

**N82-28973#** Joint Publications Research Service, Arlington, Va

**MODIFICATION OF METHOD FOR ASSAYING OZONE BY THE DIACETYL DIHYDROLUTIDINE REACTION**

B V Anisimov, G N Kuzmenko, and T I Golubeva. *In its USSR Rept. Space Biol and Aerospace Med.* V 16, No 3, May - Jun 1982 (JPRS 81197) 2 Jul 1982 p 137-139 refs. Transl into ENGLISH from Kosm. Biol. Aviakosmicheskaya Med. (USSR) v 16, no 3, May - Jun 1982 p 89-90

Avail NTIS HC A08

Ozone as the main toxic component of the atmosphere in photochemical smog and as a necessary factor for trace concentration to assure a biological quality of the atmosphere of areas with people in need of natural air ventilation was studied. Methods for measuring ozone in pressurized areas are discussed. E A K

**N82-28974#** Joint Publications Research Service, Arlington, Va

**EFFECTS OF LOW-INTENSITY ELECTROMAGNETIC FIELDS ON HUMAN AND ANIMAL ERYTHROCYTES**

V P Shabayev. *In its USSR Rept. Space Biol and Aerospace Med.* V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 140-142 refs. Transl into ENGLISH from Kosm. Biol. Aviakosmicheskaya Med. (USSR) v 16, no 3, May - Jun 1982 p 91-92

Avail NTIS HC A08

The balancing of Locke-Ringer solution and human and albino rat blood erythrocyte suspensions (50% hematocrit) prepared with this solution was studied. Changes in oxygen concentration and pH served as parameters characterizing the state of the aqueous medium. Permeability of erythrocyte membranes to water according to hemolysis was assessed. A tent which outer wall was made of ferromagnetic material, served as a shield to attenuate the electromagnetic field of Earth. Specimens were exposed for 3 hours in the ungrounded shield and ordinary conditions. The effect of the shield was assessed. The aqueous Locke-Ringer solutions stored under electromagnetic shields contain 8% more oxygen than control. It is found that with the use of the shield there is a large amount of hemoglobin and two other proteins in the intercellular region which are in the space near the cathode in electrophoresis. E A K

**N82-28975#** Joint Publications Research Service, Arlington, Va

**EFFECT OF HIGH AMBIENT TEMPERATURE ON CARBOHYDRATE METABOLISM IN RAT LIVER AND SKELETAL MUSCLES**

R Akhmedov and A M Nasyrova. *In its USSR Rept. Space Biol and Aerospace Med.* V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 143-146 refs. Transl into ENGLISH from Kosm. Biol. Aviakosmicheskaya Med. (USSR) v 16, no 3, May - Jun 1982 p 92-94

Avail NTIS HC A08

Brief and prolonged exposure to high and low ambient temperatures which leads to substantial changes in physiological reactions that maintain temperature homeostasis in organisms was studied. Adaptive changes in physiological functions are based on adaptive shifts in intensity of metabolism and energy. Organic, tissular and cellular mechanisms of change in metabolism, the significant of the different elements of metabolism in different physiological systems of the body involved in maintaining temperature homeostasis with a changing ambient temperature are investigated. Changes in carbohydrate metabolism in the liver and skeletal muscles related to exposure to high ambient temperatures, are demonstrated. E A K

**N82-28976#** Joint Publications Research Service, Arlington, Va

**VIBRATION AND ASSESSMENT OF THIS FLIGHT FACTOR BY PILOTS**

Yu N Kamenskii. *In its USSR Rept. Space Biol and Aerospace Med.* V 16, No 3, May - Jun 1982 (JPRS-81197) 2 Jul 1982 p 147-151 refs. Transl into ENGLISH from Kosm. Biol. Aviakosmicheskaya Med. (USSR) v 16, no 3, May - Jun 1982 p 94-96

Avail NTIS HC A08

Vibration on active factors in the pilot-helicopter environment system is discussed. The effect of this factor on pilot performance and its source of information on the status of the helicopter and its systems is emphasized. The role of noninstrument information (angular and longitudinal accelerations, vibration, noise) in piloting an aircraft (higher precision of control, recognition of emergency situations) is confirmed. Special purpose pilot training in the use of such negative flight factors as vibration, buffeting as information about the status of the vehicle to be controlled is recommended. Standardized and their practical use are considered. E A K

**N82-28977#** Joint Publications Research Service, Arlington, Va

**USSR REPORT. LIFE SCIENCES BIOMEDICAL AND BEHAVIORAL SCIENCES, NO. 16**

12 May 1982 87 p refs. Transl into ENGLISH of various Russian articles (JPRS-80789) Copyright Avail NTIS HC A05

The use of microorganisms to monitor environmental pollution, the biochemistry of peptide and protein bioregulators, insect breeding, rat behavior, a microelectronic electrode brain probe, and the environmental and genetic aspects of human intellectual capacities are discussed.

**N82-28978#** Joint Publications Research Service, Arlington, Va

**MICROORGANISMS USED TO MONITOR ENVIRONMENTAL POLLUTION**

G A Bagdasaryan and K V Geniatulin. *In its USSR Rept. Life Sci Biomed and Behavioral Sci.* No 16 (JPRS-80789) 12 May 1982 p 1-4 refs. Transl into ENGLISH from Gig. Sanit. (USSR) no 11, Nov 1981 p 11-13. Copyright Avail NTIS HC A05

The use of microorganisms to measure environmental pollution is discussed. Criteria for the selection of specific microorganisms depend on metabolic and genetic changes of the microorganism under the influence of pollution. Development of standardization and metrology of measurements with the required reproducibility and accuracy is considered. Mathematical methods for choosing test systems for microorganisms and their parameters for demonstration of pollutants and processing measurement results are discussed. J D

**N82-28979#** Joint Publications Research Service, Arlington, Va

**MONOGRAPH ON NEW DIRECTION OF CHEMISTRY AND BIOLOGY OF PEPTIDE AND PROTEIN BIOREGULATORS REVIEWED**

V Ivanov and A Miroshnikov. *In its USSR Rept. Life Sci Biomed and Behavioral Sci.* No 16 (JPRS-80789) 12 May 1982 p 13-15. Transl into ENGLISH from Izv. Akad. Nauk Latvinskoy SSSR (USSR) no 1, Jan 1982 p 137-138. Copyright Avail NTIS HC A05

The development of methodological and experimental approaches to the study of the mechanisms of action of low molecular peptide hormones and kinins is described. Principles of information theory were applied to studies of complex stochastic systems, and the modeling method was used with extrapolation of results from one complex system to another. The principles that determine ligand-receptor interaction in the formation of complexes of trypsin group enzymes with certain protease inhibitors are analyzed. Common, universal principles which determine peptide-protein and protein-protein interaction are outlined. The selective design and laboratory synthesis of cyclic analogs of hormones and other peptide-protein bioregulators which are more selective and have longer action than their natural prototypes are described. J D

**N82-28980#** Joint Publications Research Service, Arlington, Va

**CULTIVATION OF INSECTS AS NEW BRANCH OF ENTOMOLOGY - INDUSTRIAL ENTOMOLOGY**

N A Tamarina *In its USSR Rept Life Sci Biomed and Behavioral Sci No 16 (JPRS-80789) 12 May 1982 p 16-26* refs Transl into ENGLISH from Zool Zh (USSR), v 60, no 11 Nov 1981 p 1605-1613  
Copyright Avail NTIS HC A05

The general principles and methods of cultivating insects are formulated as a new branch of applied entomology (technical entomology) whose methodology is the systems approach and optimization theory based on modern computer technology. Cultivation of insects is viewed as the development of artificial populations with specified properties. The process of creating cultures is divided into three periods (1) the introduction of species into the laboratory (2) the development and standardization of cultures of different types, and (3) the creation of mass scale cultures with specified properties. The tasks and methods of each period are discussed. A new classification is offered for insect cultures. J D

**N82-28981#** Joint Publications Research Service Arlington, Va

**ORIENTING AND EXPLORATORY BEHAVIOR OF GRAY RAT IN OPEN FIELD. ZOOPSYCHOLOGICAL ANALYSIS**

N N Meshkova *In its USSR Rept Life Sci Biomed and Behavioral Sci No 16 (JPRS-80789) 12 May 1982 p 32-41* refs Transl into ENGLISH from Byull Mosk Obshch Ispyt Priir, Otd Biol (USSR), v 86, no 6, Nov - Dec 1981 p 22-29  
Copyright Avail NTIS HC A05

The orienting and exploratory behavior of gray rats in an open field environment was observed to contain the following behavior elements: spatial orienting stances, movement inspection of objects, and actions referable to the category of shifted activity. Each of these elements is readily distinguished in the continuum of behavior and serves a specific role in the familiarization of animals with a new terrain. The process of becoming familiar with an open field is broken down into four stages characterizing different degrees of conformity of rat behavior to the distinctions of the terrain. The animal begins to orient itself with regard to the properties of the field on the basis of its individual experience at the start of the first stage, and a complete image of the surroundings is formed at the fourth stage of exploration. J D

**N82-28982#** Joint Publications Research Service Arlington, Va

**MICROELECTRONIC ELECTRODE PROBE FOR TESTING BRAIN ELECTRICAL ACTIVITY**

B V Zhuravlev and A B Simakov *In its USSR Rept Life Sci Biomed and Behavioral Sci No 16 (JPRS-80789) 12 May 1982 p 50-52* refs Transl into ENGLISH from Izv Vyssh Ucheb Zaved, Radioelektron (USSR) v 24, no 12 Dec 1981 p 66-68  
Copyright Avail NTIS HC A05

The development and construction of a multichannel electrode probe combining both the micropipette and metal electrodes is described. The size of the active electrode surfaces is 50x50 microns and that of the contact areas is 250x250 microns. Gold is used as the material for the active electrode area. The electrical properties of the probe are described and its main electrical parameters given. The experimental introduction of the probe into the hypothalamus of a rabbit is described. J D

**N82-28983#** Joint Publications Research Service, Arlington, Va

**NATURAL AND SOCIAL DETERMINATION OF HUMAN PSYCHE**

G I Tsaregorodtsev and N I Gubanov *In its USSR Rept Life Sci Biomed and Behavioral Sci No 16 (JPRS-80789) 12 May 1982 p 72-82* refs Transl into ENGLISH from Vestn Akad Med Nauk SSSR (USSR), no 4, Apr 1981 p 56-65  
Copyright Avail NTIS HC A05

The role of biological and social factors in the inception and development of human consciousness and thinking are discussed in the light of Marxist philosophy. The development of opinions on the relative weight which is given to genetic and social factors in the development of intelligence is focussed upon. It is concluded that intelligence is determined by social factors acting upon inherited mental capacity. J D

**N82-28986\*#** Maryland Univ, Baltimore Dept of Neurology

**TESTOSTERONE ENHANCES [C-14] 2-DEOXYGLUCOSE UPTAKE BY STRIATED MUSCLE**

James Toop and Stephen R Max [1982] 22 p refs (Grants NAG2-100, NS-15766) (NASA-CR-169101, NAS 126 169101) Avail NTIS HC A02/MF A01 CSDL 06P

The effect of testosterone propionate (TP) on C-14 2-deoxyglucose (C-14 2DG) uptake was studied in the rat levator ani muscle in vivo using the autoradiographic technique. Following a delay of 1 to 3 h after injecting TP the rate of C-14 2DG uptake in experimental animals began to increase and continued to increase for at least 20 h. The label, which corresponds to C-14 2-deoxyglucose 6-phosphate, as demonstrated by chromatographic analysis of muscle extracts, was uniformly distributed over the entire muscle and was predominantly in muscle fibers, although nonmuscular elements were also labeled. The 1 to 3 h time lag suggests that the TP effect may be genomic, acting via androgen receptors, rather than directly on muscle membranes. Acceleration of glucose uptake may be an important early event in the anabolic response of the rat levator ani muscle to androgens. S L

**N82-28987#** Naval Aerospace Medical Inst, Pensacola, Fla  
**A PROCEDURE FOR THE ANALYSIS OF NYSTAGMUS AND OTHER EYE MOVEMENTS**

Graham R Barnes 23 Jun 1981 21 p refs Prepared in cooperation with the Royal Air Force Inst of Aviation Medicine (M0933PN004, MRO410103) (AD-A112603, NAMRL-1280) Avail NTIS HC A02/MF A01 CSDL 06/16

A new procedure was developed to analyze oculomotor responses to many forms of vestibular and/or visual stimuli used in experimental work and in clinical practice. The main advantage of the procedure lies in the simplicity of the basic algorithm which enables fairly rapid data analysis of a variety of response forms on a medium-speed computer working in a high-level language. For slow phase analysis, detection of saccades is carried out by a simple threshold procedure based upon the expected response form, and regression procedures are used to obtain stimulus-response correlation and slope (gain) measures. The procedure provides measures of gain phase, and directional preponderance for responses to sinusoidal stimuli. Author (GRA)

**N82-28988#** Canyon Research Group, Inc, Westlake Village, Calif

**VISUAL TECHNOLOGY RESEARCH SIMULATOR (VTRS) HUMAN PERFORMANCE RESEARCH PHASE 3 Final Report, 1 May 1980 - 30 Nov 1981**

G Lintern, B E Nelson, D J Sheppard, D P Westra, and R S Kennedy Nov 1981 45 p refs (Contract N61339-78-C-0060) (AD-A112475 TR-81-022, NAVTRAEQUIPC-78-C-0060-11) Avail NTIS HC A03/MF A01 CSDL 05/9

This report summarizes the research projects for which Canyon Research Group Inc has a major responsibility under the Visual Technology Research Simulator (VTRS) Human Performance Research Contract. The basic research approach has been multifactor and much of the experimental preparations involved demonstration of the feasibility of efficient multifactor designs. Multifactor performance and transfer studies have been completed. Other work has involved the investigation of unconventional visual displays for flight training, automatic freeze techniques for carrier landing instruction, and descent rate cuing as an aid to glideslope tracking for carrier landings. Work has also continued on the development of performance measurement and statistical analysis capabilities. Common emphases of the experimental program were that disparate and generally costly equipment features were studied experimentally in pilots making carrier landings. The general findings were that practice effects were small, main effects of equipment features modest, some display principles improve performance, and individual differences were reliable and large. The importance of fidelity for other purposes (e.g., pilot acceptance, realism) is problematic. GRA

**N82-28989#** Naval Air Development Center, Warminster, Pa  
Aircraft and Crew Systems Technology Directorate

**SIMULATION OF THE MOTION OF THE CENTER OF MASS OF AN OCCUPANT UNDER EJECTION ACCELERATIONS Final Report**



Louis A DAulero and George D Frisch (Naval Biodynamics Lab, New Orleans) Sep 1981 46 p refs  
(WF4140000)  
(AD-A113806 NADC-81305-60) Avail NTIS  
HC A03/MF A01 CSCL 06/19

The development of highly sophisticated and complex ejection seats to provide safe egress from aircraft during low altitude, high speed and adverse attitude ejections addresses the need for a reliable computer simulation capability to determine the trajectory of the seat and occupant under these conditions. The occupant response to increasingly severe acceleration profiles must, therefore, be addressed if the simulation model is to be able to evaluate the behavior of the seat/occupant system. Traditionally, the seat and occupant have been treated in combination as a rigid body for purposes of trajectory analysis. However, experience with ejection seat tests has demonstrated a considerable amount of relative motion between the occupant (typically an anthropomorphic dummy) and the seat itself. This report presents a lumped mass, spring-damper mathematical computer model to simulate the motion of the occupant's CG with respect to the seat under a dynamic ejection environment. The analysis of anthropomorphic dummy results and of computer generated biodynamic simulation data used in the evaluation of the model will be discussed. Author (GRA)

**N82-28990#** Lovelace Biomedical and Environmental Research Inst., Albuquerque, N. Mex  
**THE BIOLOGICAL EFFECTS OF REPEATED BLASTS Final Report, 30 Apr. 1980 - 30 Apr 1981**  
Donald R. Richmond, John T. Yelverton, and E. Royce Fletcher  
30 Apr 1981 42 p refs  
(Contract DNA IACRO 81-832, DNA Proj U99-QAXMK000)  
(AD-A113113 AD-E300951) Avail NTIS HC A03/MF A01 CSCL 06/21

The results of investigations on the biological effects of repeated blasts were reviewed. Sheep and swine were subjected to multiple blasts at a rate of one per minute in 100-percent mortality in 1 hour. Blast injuries to the organs in the neck (larynx, pharynx, and trachea) and the gastrointestinal tract occurred at blast overpressure levels lower than those necessary for lung hemorrhage for both single and multiple exposures. Curves estimating the LD1 for man as a function of incident overpressure and number of blasts were compiled. For a standing man the LD1 incident overpressure was 27 psi (186 kPa) for a single blast and 18 psi (124 kPa) for five blasts. The overpressures from one or five blasts required to inflict selected injuries in man were presented. Author

**N82-28991#** Arkansas Univ., Little Rock  
**PHYSIOLOGICAL STUDIES OF HEAT STRESS ACCLIMATIZATION DURING A SPECIFIC EXERCISE REGIMEN Final Report**  
Leland F. Morgans 20 Oct 1981 7 p Submitted for publication  
(Grant AF-AFOSR-0098-81, AF Proj 2312)  
(AD-A111897 AFOSR-82-0091TR) Avail NTIS  
HC A02/MF A01 CSCL 06/19

Eleven subjects were used to determine the effects of racquetball on core temperature, skin temperature, sweat production, and weight loss. The results indicated that an hour of racquetball play produced a significant increase in core temperature, a significant decrease in skin temperature, a high level of sweating and a weight loss. It was concluded that the exercise regimen of racquetball can act as a good heat stress acclimator by virtue of finding that it produced a significantly high level of hyperthermia. Author (GRA)

**N82-28992#** Naval Aerospace Medical Research Lab, Pensacola, Fla  
**DETERMINING VISUAL ACUITY THRESHOLDS A SIMULATION STUDY OF STIMULUS PRESENTATION STRATEGIES**  
David J. Blower Aug 1981 24 p refs  
(ZF51524004)  
(AD-A111821, NAMRL-1282) Avail NTIS HC A02/MF A01 CSCL 05/10

An accurate and economical method for determining visual acuity thresholds was necessary for many tests in the Vision Test Battery (VTB). There were certain unanswered questions as to how the classical up and down method of presenting stimuli would perform in this regard with a four alternative forced choice

task. To answer these questions computer simulation runs of the up and down method were carried out. A model of the psychometric function relating probability of correct detection to stimulus gap size was based on the cumulative normal distribution. The parameters of this model were chosen to characterize one of the acuity tests in the VTB. The intent of the simulation with this model was to generate a large sample of acuity thresholds, and, from this sample, form an estimate of the average acuity threshold and its variability for any given number of trials. An alternative method of presenting stimuli in a sequential manner was also studied via simulation. This method, called the bracket method, proved to be superior to the up and down method in calculating an average estimate of threshold acuity. The error attached to the threshold acuity estimate was also smaller in the bracket method. When the slope of the psychometric curve was varied over a large range, the bracket method retained these advantages over the up and down method. Author (GRA)

**N82-28993#** Army Research Inst of Environmental Medicine, Natick, Mass

**ACCLIMATIZATION TO DRY HEAT: ACTIVE MEN VERSUS ACTIVE WOMEN**

Donald H. Horstman and Elaine Christensen 29 Jan 1982  
29 p refs  
(DA Proj 3E1-61102-BS-10)  
(AD-A111708 USARIEM-M-13/82) Avail NTIS  
HC A03/MF A01 CSCL 06/19

The purposes of this study were to compare performance of exercise of equal relative intensity in dry heat and related physiological responses between active men and active women of nearly equal physical fitness level before, during and after heat acclimatization. GRA

**N82-28994#** Air Force Hospital, Wiesbaden (West Germany)  
Bioenvironmental Engineering Services Dept  
**AN INDUSTRIAL HYGIENE EVALUATION OF AIRCRAFT REFUELING INSIDE CLOSED AIRCRAFT SHELTERS AT ELEVATED AMBIENT TEMPERATURES Final Report, Aug. - Sep. 1981**

Joseph A. Martone Oct 1981 26 p refs  
(AD-A114396, BEES(W)-81-42) Avail NTIS  
HC A03/MF A01 CSCL 01/3

This report presents results of three in-shelter aircraft refueling tests with ambient temperatures of 30 C or higher. For the specific situations studied, refuel crew personnel were exposed to total fuel vapor concentrations approaching permissible exposure limits. Exposure to benzene and other selected fuel vapor components were well below permissible exposure limits. The data were normalized to predict that personnel exposures above 50 percent of the short term exposure limit for fuel vapors would occur in both first and modified first generation shelters at elevated temperatures. The data support temperature limitations for in-shelter refueling with JP-4 in first and modified first generation shelters. No such limitations were found necessary for second or third generation shelters as they provide nearly three times the dilution volume of first generation shelters. To permit in-shelter refueling above the recommended temperature limits, restrictions on the amount of fuel transferred are suggested. Special consideration is given to the F-111 aircraft because of its large fuel capacity. GRA

**N82-28995#** Oak Ridge National Lab, Tenn  
**WHAT IS ALARA**

J. A. Auxier 1981 12 p refs Presented at Edison Elec Inst Health Phys Comm Meeting, Hartford, 10 Sep 1981  
(DE81-030814, CONF-810968-1) Avail NTIS  
HC A02/MF A01

The history of ALARA and what it seemingly means to different interest groups is discussed. A balanced viewpoint that health physicists should adopt is presented. The as-low-as-reasonably-achievable (ALARA) philosophy as it applies to personnel radiation exposure is outlined. The essential tenets of this philosophy surfaced early in the history of the Manhattan Project. Although the terminology has suffered through various translations, the principles remain valid. Some regulatory agencies claim ALARA as their newfound miracle drug and that application according to their prescriptions will result in endless rounds of cyclical improvement in radiation protection practices. Advantage is taken of the popularity of ALARA and the philosophy is standardized to mean whatever is expedient for their purposes.

**N82-28996#** Medical Biological Lab RVO-TNO, Rijswijk (Netherlands)  
**THE CONSEQUENCES OF HYDRAZINE EXPOSITION AND ITS TREATMENT**

E Meeter Jun 1981 11 p refs In DUTCH ENGLISH summary  
 (Contract A76/K/098)  
 (MBL-1981-2, TDCK-75105) Avail NTIS HC A02/MF A01

The consequences for man and animals of exposure to hydrazine in the event of a crash of an F-16 aircraft whose emergency power unit contains hydrazine are described. Hydrazine and its derivatives are corrosive to eyes, mucous membranes and skin, and are harmful to many organs. The measures to be taken in case of an accident are outlined. Author (ESA)

**N82-28997#** Pennsylvania State Univ University Park Dept of Psychology  
**ADAPTIVE MOTIVATION THEORY Annual Report, 15 Dec. 1979 - 1 Feb 1981**

Frank J Landy Feb 1982 60 p refs  
 (Contract N00014-81-K-0197 NR Proj 170-906)  
 (AD-A111195, Rept-82-1) Avail NTIS HC A04/MF A01 CSCL 05/10

This report presents the theoretical foundation for a new set of propositions regarding human motivation called Adaptive Motivation Theory. The major proposition of the theory is that individuals undergo cognitive change as a result of environmental interaction. This cognitive change has implications for motivated behavior. In addition to a statement of the theory, activities for the past year and the next year are discussed. Author (GRA)

**N82-28998#** Navy Personnel Research and Development Center, San Diego, Calif

**ON MODELS AND METHODS FOR PERFORMANCE MEASUREMENT Final Report, Aug 1979 - Sep 1980**

William J Moonan Mar 1982 22 p refs  
 (AD-A113578, NPRDC-TN-82-11, NPRDC-11-80-12) Avail NTIS HC A02/MF A01 CSCL 05/9

Models were specified and methods defined that characterize performance measurement as a process and as a function of (1) the performer's capability, (2) variables that indicate how well job operations are performed and (3) the difficulties of those operations. The report shows methods of mathematical measurement model development that relate (1), (2), and (3) above. A performance quality model was defined. Illustrations of two performance models were provided through examples. Author (GRA)

**N82-28999#** Canyon Research Group Inc., Westlake Village, Calif

**UNCONVENTIONAL VISUAL DISPLAYS FOR FLIGHT TRAINING Interim Technical Report, 1 May 1980 - 30 Nov. 1981**

Robert T Hennessy (NAS-NRC) Gavan Lintern, and Stanley C Collyer (Naval Training Equipment Center) Orlando Fla Naval Training Equipment Center Nov 1981 66 p refs  
 (Contract N61339-78-C-014)  
 (AD-A111392, TR-81-014, NAVTRAEQUIPC-TR-81-014) Avail NTIS HC A04/MF A01 CSCL 05/9

Use of simulators for flight instruction has typically followed the pattern of using similar instructional approaches to those that have traditionally been used for in-flight instruction. However there is a growing awareness that a simulator permits radical departures from the traditional methods. Some of these may be less expensive or even more effective in terms of acquiring the skill. The general purpose of the research reported here was to examine training effectiveness for basic flight tasks of radically different methods of displaying the information that is necessary to support learning of the tasks. Four different visual displays were evaluated for their effectiveness in the acquisition of flight tasks in a simulator. The control condition had a wide field-of-view, a horizon and a checkerboard ground plane that obeyed laws of motion and perspective. The experimental displays were (1) a narrow field-of-view with horizon and checkerboard ground plane (2) an outside viewpoint of an aircraft, and (3) a display that consisted only of normal flight instruments. Flight-naive subjects were taught to fly straight-and-level for twenty trials with either the control or one of the experimental displays and then tested for twenty trials on the control display. Training, transfer, and differential transfer performance was examined. GRA

**N82-29000#** Naval Biodynamics Lab., New Orleans, La  
**TASK ANALYSIS AND THE ABILITY REQUIREMENTS OF TASKS COLLECTED PAPERS**

R H Shannon and Robert C Carter Sep 1981 27 p refs  
 (AD-A111181, NBDL-81R009) Avail NTIS HC A03/MF A01 CSCL 05/9

This is a collection of papers on the topic of using task analysis to identify the abilities required for jobs. Identification of ability requirements is a first step in the process of assembling performance tests that are related to a particular job. Once assembled such tests could be used for many purposes. One use would be selection of personnel who are especially gifted with the required attributes. The use to which the authors' efforts are directed is environmental research. Environmental research is the study of human performance in unusual environments (e.g., vibration, ship motion, impact) in order to determine whether and to what degree the environment affects performance. Such research is more relevant to the Navy when the human performance studied is related to Navy jobs. Author (GRA)

**N82-29001#** Forschungsinstitut fuer Anthropotechnik, Bonn (West Germany)

**THE RANKING OF DISPLAYS BASED ON TRANSFORMATION [DIE BEWERTUNG VON ANZEIGEN DURCH DEN TRANSFORMATIONENFLUSS]**

K R Kimmel Nov 1981 86 p refs In GERMAN, ENGLISH summary  
 (FB-52) Avail NTIS HC A05/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 10

Transinformation as a means to discriminate between alternative display configuration with a compensatory control task was investigated. Root-mean-square (rms) control error was used for comparison purposes. The dynamics of the controlled elements and the bandwidths of the stochastic disturbance functions served as independent parameters in the experiment. Results from both measures, in general, show good agreement being somewhat more consistent with transinformation, the superiority of which can clearly be seen when an additional auditory of visual discrete supervisory task is added. Control rms did not permit the construction of a unitary total performance measure in multiple task situations. Transinformation, on the other hand confirmed the rankings of the different display configurations which were obtained for the pure analog compensatory manual control task. Author (ESA)

**N82-29002\*** National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston Tex

**THERMAL GARMENT Patent**

James H Hopper, inventor (to NASA) (United Aircraft Corp., East Hartford, Conn) Issued 3 Jan 1967 6 p Filed 3 Sep 1964 Sponsored by NASA  
 (NASA-Case-XMS-03694-1 US-Patent-3,295,594  
 US-Patent-Appl-SN-394280, US-Patent-Class-165-46) Avail US Patent and Trademark Office CSCL 06K

An anthropomorphic thermal garment made entirely of fluid-carrying tubing, joined in such a way that the tubes form a network or mesh fabric, is described. NW

**N82-29003\*** Massachusetts Inst of Tech., Cambridge Dept of Nutrition and Food Science

**EVALUATION OF ENGINEERING FOODS FOR CLOSED ECOLOGICAL LIFE SUPPORT SYSTEM (CELSS) Final Report, 1 Feb 1980 - 1 Mar. 1982**

Marcus Karel 1 Mar 1982 162 p refs  
 (Contract NAS9-16008)  
 (NASA-CR-167626, NAS 1 26 167626) Avail NTIS HC A08/MF A01 CSCL 06K

A nutritionally adequate and acceptable diet was evaluated and developed. A design for a multipurpose food plant is discussed. The types and amounts of foods needed to be regenerated in a partially closed ecological life support system (PCELSS) were proposed. All steps of food processes to be utilized in the multipurpose food plant of PCELSS were also considered. Equipment specifications, simplification of the proposed processes, and food waste treatment were analyzed. NW

**N82-29004\*** Little (Arthur D.) Inc., Cambridge, Mass  
**NUTRITION AND FOOD TECHNOLOGY FOR A CONTROLLED ECOLOGICAL LIFE SUPPORT SYSTEM (CELSS)**  
 Peter E Glaser and Judith A Mabel May 1981 96 p refs

(Contract NAS9-15652)  
(NASA-CR-167392, NAS 1 26 167392) Avail NTIS  
HC A05/MF A01 CSCL 06K

Food technology requirements and a nutritional strategy for a Controlled Ecological Life Support System (CELSS) to provide adequate food in an acceptable form in future space missions are discussed. The establishment of nutritional requirements, dietary goals, and a food service system to deliver acceptable foods in a safe and healthy form and the development of research goals and priorities were the main objectives of the study. M D K

**N82-29005\*** California Univ Berkeley Dept of Mechanical Engineering

**A DESIGN METHODOLOGY FOR NONLINEAR SYSTEMS CONTAINING PARAMETER UNCERTAINTY: APPLICATION TO NONLINEAR CONTROLLER DESIGN**

Gary Young May 1982 90 p refs

(Contract NCC2-67)

(NASA-CR-166358, NAS 1 26 166358) Avail NTIS  
HC A05/MF A01 CSCL 05H

A design methodology capable of dealing with nonlinear systems, such as a controlled ecological life support system (CELSS), containing parameter uncertainty is discussed. The methodology was applied to the design of discrete time nonlinear controllers. The nonlinear controllers can be used to control either linear or nonlinear systems. Several controller strategies are presented to illustrate the design procedure. E A K

**N82-29006\*** Massachusetts Inst of Tech Cambridge Dept of Nutrition and Food Science

**EVALUATION OF ENGINEERING FOODS FOR CONTROLLED ECOLOGICAL LIFE SUPPORT SYSTEMS (CELSS)**

Marcus Karel Jun 1982 92 p refs

(Contract NAS9-16008)

(NASA-CR-166359, NAS 1 26 166359, CELSS-13) Avail  
NTIS HC A05/MF A01 CSCL 06K

The feasibility of developing acceptable and reliable engineered foods for use in controlled ecological support systems (CELSS) was evaluated. Food resupply and regeneration are calculated. Flow charts of food processes in a multipurpose food pilot plant are presented, and equipment for a multipurpose food pilot plant and potential simplification of processes are discussed. Food-waste treatment and water usage in food processing and preparation are also considered. A R H

**N82-29007\*** Virginia Polytechnic Inst and State Univ Blacksburg Dept of Industrial Engineering/Operations Research

**RULE-BASED PROGRAMMING FOR HUMAN-COMPUTER INTERFACE SPECIFICATION**

John W Roach and Glenn S Fowler Jan 1982 81 p refs

(Contract N00014-81-K-0143, NR Proj SRO-101)

(AD-A113036 CSIE-82-5) Avail NTIS HC A05/MF A01 CSCL 09/2

An implementation of a rule-based language related to PROLOG for the specification of human-computer interfaces is described. It is based not upon von Neumann computer architectures but rather upon Post production systems or Markov algorithms, which are the foundations of computer science. Author

**N82-29008\*** Naval Submarine Medical Research Lab, Groton, Conn

**COLD WEATHER GOGGLES. 2. PERFORMANCE EVALUATION Interim Report**

S M Luria 23 Mar 1982 17 p refs

(M0095PN001)

(AD-A114067 NSMRL-978) Avail NTIS HC A02/MF A01 CSCL 06/17

The performance of various tasks of importance to the Marines was compared when the subjects were wearing different goggles designed to protect the eyes from the cold. Color perception through yellow goggles and rifely through the most distorted goggles were degraded, but there were no significant impairments in acuity, depth perception, or vision through binoculars. The optical standards adhered to in the manufacture of commercial goggles appears to permit the satisfactory performance of practical tasks. Author (GRA)

**N82-29009\*** Naval Biodynamics Lab, New Orleans, La  
**BIOMECHANICAL ANALYSIS OF TASKS INVOLVING MANUAL MATERIALS HANDLING**

Richard H Shannon Feb 1982 27 p refs

(AD-A113955, NBDL-82R001)

Avail NTIS

HC A03/MF A01 CSCL 05/5

Biomechanics and their relationships with manual materials handling, sex differences and training are discussed. A factor analytic model of lifting in the floor knuckle and knuckle shoulder regimens under experimental conditions is considered. Sixteen subjects were divided equally into four groups of males trained/untrained and females trained/untrained. Results indicated that (1) there were different motion patterns among the four groups, (2) male movements approximated the trained and female movements the untrained conditions, and (3) trained individuals demonstrated more efficient and coordinated lifts. Training programs are recommended in the working environment if women are expected to lift moderately heavy loads because of their lower physical fitness and coordination when compared to men. This statement is further supported by the second paper which conducted a critical incident technique of 484 strain/sprain/overexertion injuries of naval civilian government workers was conducted. Results indicated that males had significantly more injuries to the back, to craftsmen/operatives/laborers, using heavy/very heavy weight. GRA

**N82-29010\*** Purdue Univ Lafayette Ind School of Engineering

**DEVELOPMENT OF A METHODOLOGY FOR ASSESSING AIRCREW WORKLOADS Final Report, Oct. 1978 - Dec. 1980**

James R Buck, James W Barany, Mark L Lehto, David M Ings, David R Payne, Roy D Nixon and William H Grosse Wright-Patterson AFB, Ohio Aerospace Medical Research Labs Nov 1981 95 p refs

(Contract F33615-78-D-0617, AF Proj 7184)

(AD-A114364, AFAMRL-TR-81-50)

Avail NTIS

HC A05/MF A01 CSCL 05/5

The adaptability of industrial methods for setting job and time standards to workload assessment requirements was investigated. Methods considered included direct and indirect time study, synthetic time systems, standard data systems, information content analysis, work sampling and job evaluation. Conventional methods were found to be deficient in accounting for task time variability, divided-attention effects, and cognitive demands which are regarded as critical to effective air crew workload assessment. A combination of synthetic time and standard data system methodologies was proposed as an effective approach to the problem. Three experiments were conducted to evaluate the feasibility of developing a Synthetic Data System (SDS) consistent with workload assessment needs. Switching communication and perceptual-mediational tasks were paired with tracking to create divided-attention demands characteristic of pilot workloads. Regression analyses showed that significant amounts of variance in task time requirements and error rates could be accounted for in terms of task and man-machine interface design variables. Development of an SDS on the basis of the performance of aircrew members in aircraft simulators is recommended. GRA

**N82-29011\*** Texas Univ, Austin Center for Cybernetic Studies

**AIRCRAFT AND CREW SCHEDULING DURING AIRLIFT OPERATIONS**

R D Armstrong (Georgia Univ), R D Charnes, and S Samn (School of Aerospace Medicine) Nov 1981 21 p refs

(Contract N00014-75-C-0569)

(AD-A114114 CCS-402) Avail NTIS HC A02/MF A01 CSCL 12/2

The Air Force is frequently placed in a situation where a large quantity of goods must be transported between various locations in a specified time period by Air Force personnel. The goods are of different and interrelated types, thus the sequence of missions is specified to maintain a proper balance of goods at each location. In addition to aircraft maintenance, health and alertness maintenance for pilots and personnel is a vital consideration in scheduling. Nevertheless, economy in operations needs to be demonstrated. Thus, the problem addressed in this paper is one of minimizing the number of crews used in the airlift, subject to crew rest requirements and the completion of all missions within the specified time frame. Author (GRA)

**N82-29012#** Wright State Univ., Dayton, Ohio School of Medicine

**FLIGHT CREWMEMBER WORKLOAD EVALUATION Final Report, Aug. 1980 - Apr. 1981**

Richard L. Sulzer, William J. Cox, and Stanley R. Mohler Apr 1981 208 p refs

(Contract F33615-80-K-3627)

(AD-A114167, DOT-FAA-RD-82-21, DOT-FAA-ASF-82-1)

Avail NTIS HC A10/MF A01 CSCL 01/3

This is a report on transport category airplane flight crew workload measurement techniques as used in cockpit development and aircraft certification tests by major U.S. airframe manufacturers. It reviews the fundamentals of crew size certification, workload measures and criteria, workload studies made during aircraft design, and workload studies made after the design has been established, including those used in flight test. Certain documentation practices are identified. The limitations of the currently used practices and the needs for improved workload measurement techniques are addressed. Author (GRA)

**N82-29669#** Institut fuer Angewandte Geodäsie, Frankfurt am Main (West Germany)

**TRAINING OF PERSONNEL SPECIALIZED IN CARTOGRAPHY [AUSBILDUNG VON KARTOGRAPHISCHEN FACH-PERSONAL]**

Gisela Beer In its Rept on Cartography and Geodesy Ser 1 Original Rept., No. 86 1981 p 55-60 In GERMAN Original contains color illustrations

Avail NTIS HC A06/MF A01

Training since 1956, at the Berlin branch office of the Institute for Applied Geodesy is reviewed. The evolution of training requirements is discussed. Recruiting and hiring practices are summarized. Training at the university and professional levels is outlined. Author (ESA)

**N82-29848#** George Washington Univ., Washington, D.C. Dept of Medical and Public Affairs

**BIOMEDICAL RESEARCH PUBLICATIONS: 1980 - 1982 Final Report**

Linda Pleasant and Letty Limbach Washington NASA Jul 1982 49 p

(Grant NASw-3165)

(NASA-CR-3587, NAS 1 26 3587)

Avail NTIS

HC A03/MF A01 CSCL 06C

Publications concerning the major physiological and psychological problems encountered by man when he undertakes space flight are listed. Nine research areas are included: cardiovascular deconditioning, motion sickness, bone alterations, muscle atrophy, blood cell alterations, fluid and electrolyte changes, radiation effects and protection, behavior and performance, and general biomedical research. NW

**N82-29849#** Army Research Inst of Environmental Medicine, Natick, Mass. Heat Research Div

**HYPO- AND HYPERGLYCEMIA IN RATS: EFFECTS ON THE ABILITY TO WORK IN THE HEAT**

Ralph P. Francesconi and Milton Mager 3 Feb 1982 25 p refs

(DA Proj 3E1-61102-BS-10)

(AD-A111711, USARIEM-M-15/82)

Avail NTIS

HC A02/MF A01 CSCL 06/19

To investigate the hypothesis that circulating glucose levels may affect exercise performance and the severity of hyperthermic injury, rats were made hypoglycemic (IV insulin, 4U) or hyperglycemic (IP glucose, 750mg) before exercise in the heat to hyperthermic exhaustion ( $T_{re} \approx 42.5-43^\circ\text{C}$ ). The endurance capacity of rats administered glucose was significantly greater than that of insulin treated, while neither was different from saline treated controls. Hematocrit levels were unaffected by exercise in control and insulin treated rats, but were significantly increased in the glucose treated. Lactate levels were increased post-run in all groups, and these increments were exacerbated in glucose treated rats. Glucose levels pre-run were decreased by insulin and increased by glucose, and remained depressed post-run in the insulin treated group. Potassium concentrations were reduced by insulin administration. Creatine phosphokinase, urea nitrogen, and creatinine were increased post-run in all groups. Mortality rates following heat/exercise injury were unaffected by glucose levels. We concluded that while hyperglycemic rats had increased endurance when compared to hypoglycemic

animals, the severity of the hyperthermic injury was unaffected by circulating glucose levels. Author (GRA)

**N82-29850#** VSE Corp., Alexandria, Va.

**TECHNICAL ASSESSMENT OF THE PREVENTION OF MICRO-FOULING ON OTEC HEAT-TRANSFER SURFACES THROUGH THE USE OF ULTRAVIOLET RADIATION Final Report**

G. A. Garrigan, R. P. Schmitt, and V. J. Ciccone (Ciccone (V. J.) and Associates, Inc., Woodbridge, Va.) Sep 1981 95 p refs

(Contract DE-AC02-78ET-21002)

(DE82-005489, DOE/ET-21002/T21)

Avail NTIS

HC A05/MF A01

To reduce or eliminate biofouling by microorganisms, seawater entering heat exchangers is sterilized (or at least sanitized) by UV radiation at 253.7 nm. The feasibility of applying this technology to OTEC is examined. Calculations based on the Lambert-Beer equation and reasonable assumptions about seawater quality and the intensity of irradiation obtainable from a UV lamp suggest seawater is transparent enough to a collimated beam of UV light to deliver effective germicidal doses to nearly 150 cm under some conditions. However, the practical limit on the depth of effective radiation from commercial lamps is severely restricted by many factors including the natural divergence of light, absorption and scattering in the media, intensity of radiation from the light source and so forth. Even under very favorable conditions a common design allowing UV light to penetrate 30 cm of water would have to permit the water at that distance to be in contact with the light for 20 seconds or so to deliver the germicidal effect of high quality sanitization but not necessarily sterilization. DOE

**N82-29851#** Argonne National Lab., Ill. Components Technology Div

**OTEC-1 POWER SYSTEM TEST PROGRAM BIOFOULING AND CORROSION MONITORING ON OTEC-1**

A. P. Gavin and T. M. Kuzay Sep 1981 53 p refs

(Contract W-31-109-eng-38)

(DE82-007035, ANL/OTEC-BCM-027)

Avail NTIS

HC A04/MF A01

Biofouling and corrosion experiments performed on board the ocean energy converter during the OTEC-1 deployment are summarized. The equipment installed for the experiments, details of the operating history of the experiments, and results obtained are described. DOE

**N82-29852#** California Univ., Berkeley Lawrence Berkeley Lab. Chemical Biodynamics Div

**ORIENTATION AND ENERGY-TRANSFER STUDIES ON CHLOROPHYLL IN THE PHOTOSYNTHETIC MEMBRANE Ph.D. Thesis**

John Arthur Nairn Dec 1981 216 p refs

(Contract W-7405-eng-48)

(DE82-010180, LBL-13827) Avail NTIS HC A10/MF A01

The two methods of study used for the light reactions of photosynthesis are orientation dependent spectroscopy and picosecond resolution of the fluorescence decay kinetics. Analysis of spectroscopic measurements on complex partially ordered ensembles, such as photosynthetic systems, is usually limited by knowledge of the orientational distribution function. A new method of parametrically representing the distribution function using a physical model of the partially ordered ensemble is described. The parametric representation of the distribution function is the density of states function. Many formulas are included which can be used to calculate density of state functions for a large range of problems. Fluorescence decay kinetics in chloroplasts from green plants and algae are investigated using a synchronously pumped, mode-locked dye laser as an excitation source. DOE

**N82-29853#** Joint Publications Research Service Arlington, Va.

**USSR REPORT. LIFE SCIENCES. BIOMEDICAL AND BEHAVIORAL SCIENCES, NO. 17**

2 Aug 1982 110 p refs Transl into ENGLISH from various Russian publications

(JPRS-81419) Avail NTIS HC A06/MF A01

Advances in biotechnology and radiation biology are addressed. Emphasis is placed on analysis of the environment to detect air and water pollution and the biological effects of irradiation and long term exposure to low doses of gamma

radiation. Other topics covered include biochemistry, medicine, microbiology, pharmacology, physiology and psychiatry.

**N82-29855#** Joint Publications Research Service, Arlington, Va.

**ATTENUATION OF RADIOPROTECTIVE EFFECTS OF ACUTE HYPOXIA ON ANIMALS ADAPTED TO HIGH ALTITUDES**

P. Kazymbetov. *In its* USSR Rept. Life Sci. Biomed and Behavioral Sci., No. 17 (JPRS-81419) 2 Aug 1982 p. 76-79 refs. Transl. into ENGLISH from Med Radiol (USSR), v. 27, no. 3, Mar 1982 p. 60-62.

Avail. NTIS HC A06/MF A01

The range of modification of radiosensitivity by acute hypoxia (6% oxygen) in animals adapted to high altitudes was investigated. Experiments were conducted on mongrel white rats and mice kept at an altitude of 3340 m above sea level for 40 days and on a control group kept at 800 m above sea level. The animals were irradiated in air and under hypoxic conditions. Animal survival for 30 days after irradiation and quantity of bone marrow cells in one thigh on the third postirradiation day served as criteria of radiosensitivity. The toxicity of acute hypoxia for control and adapted animals was also tested. The attenuation of radioprotective effects of acute hypoxia was demonstrated. It was also demonstrated that the diminished effect of acute hypoxia persists for several days after adaptation. Also, results show that adapted animals were twice as resistant to acute hypoxia as control animals. J M S

**N82-29856#** Joint Publications Research Service, Arlington, Va.

**CYTOGENETIC ANALYSIS OF PERIPHERAL BLOOD LYMPHOCYTES OF INDIVIDUALS EXPOSED TO LOW DOSES OF IONIZING RADIATION**

S. P. Petrova. *In its* USSR Rept. Life Sci. Biomed and Behavioral Sci., No. 17 (JPRS-81419) 2 Aug 1982 p. 80-84 refs. Transl. into ENGLISH from Med Radiol (USSR), v. 27, no. 3, Mar 1982 p. 70-72.

Avail. NTIS HC A06/MF A01

The peripheral blood of 30 men who had been exposed to external gamma radiation over an extended period of time was analyzed. The incidence of chromosomal aberrations in the peripheral blood lymphocytes was examined. Findings revealed that there was no appreciable change in the incidence of structural aberrations in peripheral blood lymphocytes with chronic exposure to radiation in low doses as compared to the spontaneous level. J M S

**N82-29857#** Joint Publications Research Service, Arlington, Va.

**USSR REPORT LIFE SCIENCES BIOMEDICAL AND BEHAVIORAL SCIENCES, NO. 18**

3 Aug 1982 111 p. refs. Transl. into ENGLISH from various Russian publications (JPRS-81428). Copyright. Avail. Issuing Activity.

Investigations in virology, cloning, echolocation, artificial hearts, and medical demography are reported. The effects of laser transmission on humans, analysis of taste perception and the use of computer to quantitatively estimate hoarseness are other areas of interest discussed.

**N82-29858#** Joint Publications Research Service, Arlington, Va.

**THEORETICAL AND PRACTICAL ASPECTS OF USING ACOUSTIC REPELLANTS TO SCARE BIRDS. PART 1. INTERSPECIFICITY AND GEOGRAPHIC (REGIONAL) DISTINCTIONS OF ACOUSTIC REPELLANTS**

A. V. Tikhonov and V. S. Shevyakov. *In its* USSR Rept. Life Sci. Biomed and Behavioral Sci., No. 18 (JPRS-81428) 3 Aug 1982 p. 43-48 refs. Transl. into ENGLISH from Biol. Nauki (USSR) no. 1 Jan 1982 p. 45-49.

Avail. Issuing Activity.

The interspecificity of alarm and distress signal effects on Larines, Corvidae and starlings was investigated as well as geographic aspects of using these signals as acoustic repellants. It was established that repellent reactions are induced in birds by signals not only of closely related species, but of systematically

distant groups that are biocenotically close neighbors. The interspecificity of repellent signals is manifested the most during the nesting period. Author.

**N82-29859#** Joint Publications Research Service, Arlington, Va.

**ELECTROMETRIC INVESTIGATION OF HUMAN GUSTATORY ANALYZER UNDER NORMAL CONDITIONS AND IN SIMULATED WEIGHTLESSNESS**

I. Ya. Yakovleva. *In its* USSR Rept. Life Sci. Biomed and Behavioral Sci., No. 18 (JPRS-81428) 3 Aug 1982 p. 73-76 refs. Transl. into ENGLISH from Otorinolaringol (USSR) no. 2 Mar - Apr 1982 p. 15-17.

Avail. Issuing Activity.

Altered perception of the taste of food took place in a number of cosmonauts and also in healthy individuals when some of the effects of weightlessness were simulated on Earth. Electrometrical investigation of taste was used to study the gustolingual reflex and apparently can be performed by the subjects themselves. In this connection, the method is of interest for space medicine. A R H

**N82-29860#** Joint Publications Research Service, Arlington, Va.

**SIGNIFICANCE OF MINUTE VOLUME PARAMETERS TO EVALUATION OF VESTIBULAR STABILITY**

A. S. Gusarov. *In its* USSR Rept. Life Sci. Biomed and Behavioral Sci., No. 18 (JPRS-18428) 3 Aug 1982 p. 88-91. Transl. into ENGLISH from Voenno-Med. Zh. (USSR), no. 8, Aug 1981 p. 48-50.

Avail. Issuing Activity.

Respiration rate, minute volume, heart rate, and EKG were recorded in 100 men between 22 and 35 years of age using an automatic vestibular chair to which was connected a Fizilog instrument with Reservy unit, a digital printer, and a 12 channel magnetolectric oscillograph. A 5 minute test for endurance of cumulative Coriolis accelerations with intermittent exposure was used to study vestibulovegetative reflexes. Subjects were grouped according to (1) high vestibulovegetative reactions, (2) moderate stability, and (3) poor motion tolerance. More than 3000 vestibulovegetative reactions were recorded. Results show that the first group of subjects endured the 5 min test without complaints or external vestibulovegetative manifestations. The second group presented moderate pallor, perspiration and nausea, mainly in the 3d-5th min before stopping and after stops. Marked autonomic reactions were (pallor, cold sweat, nausea, vomiting) were observed in the third group either immediately after stopping the first time, or after the second-third time. A R H

**N82-29861#** Joint Publications Research Service, Arlington, Va.

**PHASE ANALYSIS OF DYNAMICS OF GALVANIC SKIN RESPONSES IN MAN**

A. A. Krauklis, A. A. Aldersons, and I. A. Spandega. *In its* USSR Rept. Life Sci. Biomed and Behavioral Sci., No. 18 (JPRS-81428) 3 Aug 1982 p. 92-95 refs. Transl. into ENGLISH from Iz Akad. Nauk Latv. SSR (USSR) no. 2, Feb 1981 p. 123-125.

Avail. Issuing Activity.

The influence of the heat factor and, in particular, ambient temperature on the appearance and dynamics of GSR in different parts of the human body both in a state of relative rest and with graded mental, emotional and physical loads was studied. Results obtained using 1140 subjects of both sexes, ranging in age from 18 to 86 years show that the dynamics of development of the galvanic skin response presents distinct phases which depend on ambient temperature, and emotional and physical tension. It was established that GSR dynamics undergo five phases with rapid elevation of temperature. A R H

**N82-29862\*** National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

**ACOUSTIC TOOTH CLEANER Patent**

Joseph S. Heyman, inventor (to NASA). Issued 25 May 1982. 5 p. Filed 14 Aug 1980. Supersedes N81-12734 (19 - 03, p. 0392).

(NASA-Case-LAR-12471-1 US-Patent-4,331,422)

US-Patent-Appl-SN-178193, US-Patent-Class-433-125,

US-Patent-Class-433-118 US-Patent-Class-433-86

US-Patent-Class-128-62A) Avail US Patent and Trademark Office CSCL 06B

An acoustic oral hygiene unit is described that uses acoustic energy to oscillate mild abrasive particles in a water suspension which is then directed in a low pressure stream onto the teeth. The oscillating abrasives scrub the teeth clean removing food particles, plaque, calculus, and other foreign material from tooth surfaces, interproximal areas, and tooth-gingiva interface more effectively than any previous technique. The relatively low power output and the basic design makes the invention safe and convenient for everyday use in the home without special training. This invention replaces all former means of home dental prophylaxis, and requires no augmentation to fulfill all requirements for daily oral hygienic care.

Official Gazette of the U S Patent and Trademark Office

**N82-29863\*** National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md

**IMPLANTABLE ELECTRICAL DEVICE Patent**

Murzban D Jhabvala, inventor (to NASA) Issued 5 Jan 1982 5 p Filed 27 May 1980 Supersedes N80-27073 (18 - 17, p 2329)

(NASA-Case-GSC-12560-1, US-Patent-4,308,868.

US-Patent-Appl-SN-153246, US-Patent-Class-128-421) Avail US Patent and Trademark Office CSCL 06B

A fully implantable and self contained device is disclosed composed of a flexible electrode array for surrounding damaged nerves and a signal generator for driving the electrode array with periodic electrical impulses of nanoampere magnitude to induce regeneration of the damaged nerves.

Official Gazette of the U S Patent and Trademark Office

**N82-29864#** Canada Inst for Scientific and Technical Information, Ottawa (Ontario)

**THE UTILIZATION OF MACROMOLECULES IN BLOOD PURIFICATION SYSTEMS**

K Takakura and Toshihide Nakashima 1982 31 p refs Transl into ENGLISH from Kagaku Zokan (Japan), no 84, 1980 p 141-152

(NRC/CNR-TT-2021, ISSN-0077-5606) Avail NTIS HC A03/MF A01

The macromolecular membranes and adsorbents that play essential roles in blood purification systems as well as materials that are used to coat the adsorbents are discussed. The KF 101 dialyzer employs hollow fibers made of an ethylene-vinyl alcohol copolymer (EVA). The DHP-1 blood purifier utilizes activated charcoal coated with hydroxyethyl methacrylate (HEMA). These macromolecules are discussed from the standpoint of their medical utility. NW

**N82-29865\*#** Technology, Inc., Houston, Tex Life Science Div

**NEUROCHEMICAL BACKGROUND AND APPROACHES IN THE UNDERSTANDING OF MOTION SICKNESS Final Report**

Randall Lee Kohl Washington NASA Jul 1982 54 p refs (Contract NAS9-14880)

(NASA-CR-3569, NAS 1 26 3569, S-515) Avail NTIS HC A04/MF A01 CSCL 06P

The problems and nature of space motion sickness were defined. The neurochemical and neurophysiological bases of vestibular system function and of the expression of motion sickness were reviewed. Emphasis was given to the elucidation of the neuropharmacological mechanisms underlying the effects of scopolamine and amphetamine on motion sickness. Characterization of the ascending reticular activating system and the limbic system provided clues to the etiology of the side effects of scopolamine. The interrelationship between central cholinergic pathways and the peripheral (autonomic) expression of motion sickness was described. A correlation between the stress of excessive motion and a variety of hormonal responses to that stress was also detailed. The cholinergic system is involved in the efferent modulation of the vestibular hair cells, as an afferent modulator of the vestibular nuclei, in the activation of cortical and limbic structures, in the expression of motion sickness symptoms and most likely underscores a number of the hormonal changes that occur in stressful motion environments. The role of lecithin in the regulation of the levels of neurotransmitters was characterized as a possible means by which cholinergic neurochemistry can be modulated. Author

**N82-29866#** Army Research Inst of Environmental Medicine, Natick Mass

**DETERMINATION OF MAXIMAL AEROBIC POWER DURING UPPER BODY EXERCISE**

Michael N Sawka, Michael E Foley, Nancy A Pimental, Michael M Toner, and Kent B Pandolf 3 Feb 1982 26 p refs (AD-A111712, USARIEM-M-14/82) Avail NTIS

HC A03/MF A01 CSCL 06/19

The purpose of this investigation was to evaluate four protocols for their effectiveness in eliciting maximal aerobic power (peak VO<sub>2</sub>) during arm crank exercise. Comparisons were made between (1) a continuous (CON) and an intermittent (INT) protocol (both employed a crank rate of 50 rpm), and (2) the CON protocol employing crank rates of either 30, 50, or 70 rpm. For the first group of experiments no significant differences were found between the CON and INT protocols for peak VO<sub>2</sub>, maximal pulmonary ventilation (VEmax), maximal heart rate (HRmax) or maximal blood lactate (Lamax) responses. For the second group of experiments, the CON-50 was compared to the CON-30 and CON-70 protocols. In comparison to the CON-50, significantly higher peak VO<sub>2</sub> (+10%) and VEmax (+14%) responses were elicited by the CON-70 protocol, whereas significantly lower peak VO<sub>2</sub> (-11%), VEmax (-23%), HRmax (-8%), and Lamax (-29%) responses were elicited by the CON-30 protocol. These data indicate that for arm crank exercise the combination of a continuous design and a crank rate of 70 rpm provides the most effective protocol to elicit peak VO<sub>2</sub> values. Author (GRA)

**N82-29867#** Federal Aviation Administration, Washington, D C Office of Aviation Medicine

**ALCOHOL-INDUCED PHYSIOLOGICAL DISPLACEMENTS AND THEIR EFFECTS ON FLIGHT RELATED FUNCTIONS**

Michael T Lategola, Peggy J Lyne, and Mary J Burr Mar 1982 22 p refs

(AD-A114919, FAA-AM-82-3) Avail NTIS HC A02/MF A01 CSCL 06/19

Tolerances of human subjects for orthostasis and physical work were determined at a simulated altitude of 3,048 m. Orthostasis was induced with a lower body negative pressure (LBNP) device and physical work was done on a pedal ergometer. Altitude was simulated in a hypobaric chamber. Tests were carried out under two experimental conditions: (1) after subjects drank an alcoholic beverage, or (2) after subjects drank a placebo beverage (no alcohol). The alcoholic beverage produced blood alcohol concentrations (BAC's) of about 90 mg/100 ml of blood (90 mg percent). At altitude, arterial oxyhemoglobin saturation (HbO<sub>2</sub>) remained adequately compensated but was lower after alcohol than after placebo intake. Arithmetic and eye/hand coordination performances were both significantly decreased after school Ergometry, after alcohol, was well tolerated despite some decreased cardiorespiratory efficiency. The LBNP applied around peak BAC at altitude was tolerated without subjectively adverse symptoms despite significant decreases in several cardiovascular parameters. Cardiovascular adequacy along with maintained plasma volume around peak BAC appeared to be temporarily protective against orthostatic incapacitation during LBNP. Reversal of this temporary orthostatic protection during BAC recession is possible. Author (GRA)

**N82-29868#** Dayton Univ., Ohio Research Inst SEGMENTATION AND ANALYSIS OF STEREOPHOTO-METRIC BODY SURFACE DATA Final Report

L Douglas Baughman Wright-Patterson AFB, Ohio AMRL Apr 1982 193 p refs

(Contract F33615-78-C-0504, AF Proj 7231)

(AD-A114916, UDR-TR-81-51 AFAMRL-TR-81-96) Avail NTIS HC A09/MF A01 CSCL 06/2

A stereophotometric data set, describing the body surface of a subject was segmented into nineteen groups of stereophotometric data, the data in each group describing the surface of a body segment. The process was repeated for a total of 59 such data sets. The data resulting from each of these segmentation processes were then analyzed for inertial properties and location and orientation of both anatomical and principal axis systems. The accumulated body volume as a function of vertical distance from the floor was also tabulated for all the data sets.

Author (GRA)

**N82-29869#** Monsanto Research Corp., Dayton, Ohio SUPERIOR HEAT-TRANSFER FLUIDS FOR SOLAR HEATING AND COOLING APPLICATIONS RESULTS OF ACUTE ORAL TOXICITY DETERMINATIONS Final Report, 15 Sep.



1980 - 30 Apr. 1981

Leo Parts and David L Conine Nov 1981 127 p Prepared jointly with Hill Top Research, Cincinnati (Contract DE-AC04-78CS-35356) (DE82-003071 MRC-DA-1096-Vol-2) Avail NTIS HC A07/MF A01

Acute oral toxicity test were performed on heat transfer fluids Results obtained for 23 fluid samples are presented LFM

**N82-29870#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

# **PHYSIOPATHOLOGY AND PATHOLOGY OF SPINAL INJURIES IN AEROSPACE MEDICINE**

R P Delahaye and R Auffret Feb 1982 338 p refs (AGARD-AG-250(Eng), ISBN-92-835-1415-7) Avail NTIS HC A15/MF A01

The anatomy and biomechanics of the spine are reviewed and spinal stress in flight is described The aetiology and pathogenesis of spinal fracture, the clinical examination and radiology of spinal trauma postural disorders of helicopter and combat aircraft pilots, and flight fitness are considered Medico-legal aspects of spinal disorders, including intervertebral arthritis, spondylolisthesis, and inflammatory rheumatic conditions are addressed For individual titles, see N82-29871 through N82-29892

**N82-29871#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

# **ANATOMY OF THE SPINE**

C Kleitz and R P Delahaye *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 9-28

Avail NTIS HC A15/MF A01

The embryology of the spine, general and special regional characteristics of vertebrae, interconnections and articulations, the spine as a whole, and the spine in the seated position are depicted in anatomical drawings and described ARH

**N82-29872#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

# **BIOMECHANICS OF THE SPINE**

C Kleitz and R P Delahaye *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 29-45

Avail NTIS HC A15/MF A01

The spine has at least three basic biomechanical functions (1) transmit the weight and the flexing movements of the head and the trunk to the pelvis (2) allow physiological movement between the head, trunk, and pelvis, and (3) protect the spinal cord from trauma caused by forces and movements The functional biomechanics of the intervertebral disk, the intervertebral ligaments, the vertebrae, and the spinal column are illustrated and discussed The role of the thoracic cage and muscles is also examined ARH

**N82-29873#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

# **SPINAL STRESSES IN FLIGHT**

R Auffret and H Viellefond *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 47-54

Avail NTIS HC A15/MF A01

The spine of a pilot is subjected to two types of stresses those inherent in flight which are of relatively low intensity and are related to the time for which they act, and those which are uncommon but of very high intensity whose effects are related to the mechanical strength of the spinal column and can lead to fractures The former represent the problem of fatigue of materials, the latter the problem of the strength of materials The physiological effects of aircraft acceleration and vibration during flight are analyzed The mechanical effects on the human body of the very high accelerations (impacts) associated with ejection from high performance aircraft at high speed and during crash landings away from prepared runways are examined ARH

**N82-29874#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

# **THEORIES OF THE PATHOGENESIS OF FRACTURES OF THE SPINE**

R P Delahaye and P J Metges *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 57-59

Avail NTIS HC A15/MF A01

The mechanisms of fractures of the thoraco-lumbar spine and of the cervical spine are distinguished The different aetiological circumstances in which traumatic lesions occur (crash, parachuting, ejection accidents in flight accidents on centrifuges and sleds) are examined Clinical studies and practical methods of examination that are often neglected are considered Radiology must be carried out early, using optimal techniques to yield radiographs that, with the clinical examinations, can facilitate the establishment of an accurate inventory of the lesions The numerous after-effects of trauma must be detailed, for they produce a very special clinical and radiological picture with which every flight surgeon should be thoroughly familiar ARH

**N82-29875#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

# **AETIOLOGY AND PATHOGENESIS**

R P Delahaye and R Auffret *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 60-65

Avail NTIS HC A15/MF A01

Records of accident investigations of light civil aircraft, gliders military aircraft, and civil and military transport aircraft show that the pathogenesis of fractures of the vertebral column and the associated lesions resulting from crashes is almost identical The localization of spinal fractures in crashes the forces and accelerations in crashes, and the effect of deceleration when the body is restrained by an abdominal belt are considered ARH

**N82-29876#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

# **HELICOPTER ACCIDENTS**

B Vettes and R P Delahaye *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 66-71

Avail NTIS HC A15/MF A01

The uses of helicopters in civil and military operations are reviewed and it is shown that the advantages of maneuverability, vertical take-off and landing hovering, and the need for unsophisticated ground base contribute to the frequent, often serious accidents of these aircraft Statistical studies of civil and military helicopters, and the distribution of vertebral fractures in helicopter accidents are discussed The schematic division of crashes into ground impact in autorotation and crash with loss of control of aircraft corresponds to a distinction between crashes with the possibility of survival and unsurvivable crashes The pathogenesis of vertebral lesions is discussed for crashes in which the impact is purely vertical (accident in autorotation) and crashes with a significant horizontal impact component (poor chance of survival) Case histories of crash injuries are used to show that the risk of fatal accidents, which is 0.34 per 10,000 flying hours, must be reduced ARH

**N82-29877#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

# **EJECTION OF PILOTS FROM COMBAT AIRCRAFT**

R P Delahaye, R Auffret and B Vettes *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 72-96

Avail NTIS HC A15/MF A01

The history of scientific studies of pilot escape especially at high speeds from combat aircraft, is reviewed and the principles of the ejection seat are examined The different phases of ejection (initiation, seat firing and egress from the aircraft separation of the seat landing survival and rescue) are described Normal configurations abnormal configurations and the extraction (YANKEE system) are discussed as well as the overall results of ejection and the results as a function of in-flight factors The distribution of ejection lesions, and the pathogenic mechanisms of spinal fractures during ejection are examined Parachute opening shock and pathological factors associated with landing are also considered ARH

**N82-29878#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**PARACHUTING**

A Leger and R P Delahaye *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 97-121

Avail NTIS HC A15/MF A01

The physiopathology and etiology of parachute descents are examined during (1) leaving the aircraft to parachute opening, (2) parachute opening and (3) descent on the deployed parachute. Military parachuting techniques and training of military parachutists and fracture and trauma of the spine during parachuting as a means of transport are examined. Other lesions and traumatic sequelae of parachuting are described. General conditions of parachuting as a sport, the equipment used, and spinal trauma in sport parachuting are also covered. Hang gliding and the limits of human tolerance for impacts in free fall are discussed. **AR H**

**N82-29879#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**LIMITS OF HUMAN TOLERANCE FOR IMPACTS IN FREE FALL**

*In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 122-126

Avail NTIS HC A15/MF A01

Various techniques used to study the degree of human resistance to impact during an unimpeded fall, jump, or dive from a known point to a known point are described. The physical factors which influence the nature, size, and severity of the lesions received are amplitude, direction of forces, distribution of forces, area of application, and duration. Biological factors (physical condition) are also closely related to impact tolerance. Injuries resulting from impacts into water and at terminal velocity are reported from case histories. **AR H**

**N82-29880#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**FRACTURES OF THE SPINE IN FLIGHT**

R P Delahaye and R Auffret *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 127-131

Avail NTIS HC A15/MF A01

Case histories show that fractures of the spine can occur in the pilot of combat aircraft during rapid vibrational phenomena (induced oscillation) and with inadvertent unlocking of the seat, an event which produces additional accelerations which lead to a sudden compression of the vertebral column. During turbulence, a flight attendant thrown against the wall or the seats of an aircraft sometimes receives a fracture of the spine. More rarely, cervical sprains occur during aerobatics. **AR H**

**N82-29881#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**ACCIDENTS IN CENTRIFUGES AND EXPERIMENTS (EJECTION SEAT TRAINING TOWERS, SLEDS)**

R P Delahaye and R Auffret *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 132-135

Avail NTIS HC A15/MF A01

The performance characteristics of the centrifuge at CEV (Bretigny) are described as well as the protocol used. Results of studies at 6.5 G, 9 G, 11.5 G and 13.5 G are examined to indicate the types of injuries that occurred. Factors responsible for the low incidence of injuries on ejection seat training rigs and rocket sleds are mentioned. **AR H**

**N82-29882#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**CLINICAL EXAMINATION OF SPINAL INJURIES**

P Doury and G Leguay *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 136-138

Avail NTIS HC A15/MF A01

Manipulation of the subject in the erect, sitting, or lying position occurs following history taking and precedes radiology. In case of severe injury, clinical examination must always be cautious, usually with the patient lying on his back. In the upright position, the patient is examined from the front, back, and side as well as while walking on the toes and heels. Procedures for examining the seated, supine, and prone patient should be followed by neurological and gynecological examination. The identification of thoraco-lumbar and cervical fractures is described. It is indicated

that simple fractures of the spine are clinically silent in 15% to 20% of cases and that the most searching examination cannot provide sufficient evidence to eliminate with certainty the fracture of the spinal column. **AR H**

**N82-29883#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**RADIOLOGY OF SPINAL TRAUMA IN AVIATION MEDICINE**

R P Delahaye and P J Metges *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 139-186

Avail NTIS HC A15/MF A01

Radiological examination of the spine in aerospace medicine is the same as that of any recent spinal trauma, and it obeys the same principles. The examination is carried out as soon as possible after an aviation accident. The entire spine is X-rayed segmentally, with frontal and lateral films. The examination consists of diagnostic radiography and complementary radiological assessment (localized and oblique views, tomography, dynamic films, examinations with the contrast media, scanning). **S L**

**N82-29884#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**ANALYTICAL STUDY OF TRAUMATIC LESIONS OF C3-C7**

*In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 187-198

Avail NTIS HC A15/MF A01

In a frontal view in a neutral position, the spines are aligned, and the distances between them are more or less equal. Any deviation of the line of the spines is evidence of a unilateral dislocation, and increase in the distance between two spines always indicates a dislocation. In a straight lateral view, the articular processes are superimposed. If they appear separated at a given level when they are superimposed below, a fracture of the articular processes is sought. The separation indicates a rotation. Traumatic lesions of the cervical spine are often unstable. This instability is not always evident on standard X-rays. It is sometimes necessary to carry out careful dynamic examinations on a second occasion. **S L**

**N82-29885#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**RADIOLOGICAL STUDY OF FRACTURES OF C1 AND C2**

*In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 199-210

Avail NTIS HC A15/MF A01

Fractures of the axis and atlas of the C1 and C2 area represent 15 to 25% of the fractures of the cervical spine, and preferentially affect the odontoid. The angles from which the X-rays are taken must be strictly controlled. The frontal view can only be interpreted if the spinous process of C2 is projected on the center of the body atlas. In profile, in the normal state, the posterior border of the odontoid should lie on a straight line extended from that of the body. In contrast, the anterior border lies obliquely. The space between the anterior edge of the odontoid and the posterior border of the anterior arch of the atlas should not exceed 3 mm. The state of the soft tissues in front of the spine should always be carefully assessed. **S L**

**N82-29886#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**SEQUELAE OF VERTEBRAL FRACTURES AND TRAUMA**

R P Delahaye and P J Metges *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 211-223

Avail NTIS HC A15/MF A01

The broad principles of treatment of traumatic lesions and fractures of the spine in aviation medicine are the same as those in general practice. A general scheme in accordance with the different philosophies of various schools of orthopaedic surgery, is presented and the very common thoraco-lumbar fractures of the spine are contrasted with the more severe fractures of the cervical spine. **S L**

**N82-29887#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**BACKACHE IN HELICOPTER PILOTS**

R P Delahaye, R Auffret, P J Metges, J L Porrier, and B

Vettes *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 225-260

Avail NTIS HC A15/MF A01

Back pains in helicopter pilots are studied. These pains are usually caused by the vibrations of the helicopter. The picture is of a low grade tiring heavy ache localized in the lumbar region, or sometimes lower. It extends laterally often predominantly to one side and may radiate to the buttocks, the iliac crests or, more rarely, the groin. This discomfort is brought on by flight aggravated by lifting effort or by long car journeys and relieved by lying down and by physiotherapy. S L

**N82-29888#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**THE CERVICAL COLUMN OF PILOTS OF COMBAT AIRCRAFT**

R P Delahaye and R Auffret *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 261-263

Avail NTIS HC A15/MF A01

The pilots of high performance fighter aircraft sometimes complain of cervical pain during flight at low altitude. The level of vibrations is especially high and the pilot is often leaning forward in a fixed position. The character of the workload, notably in high performance combat aircraft (Mach 2) is considered in studying this problem. S L

**N82-29889#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**THE SPINE AND FITNESS FOR FLIGHT**

R P Delahaye, R Auffret, G Leguay, P Doury, P J Metges, and C Kleitz *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 264-289

Avail NTIS HC A15/MF A01

The harmful effects of flight factors studied and the analysis of different sets of statistics confirm that the vertebral column is subjected to a certain number of more or less severe stresses in the course of a flying career. It is necessary to define some criteria of fitness, as far as the spine is concerned, in relation to the type of aircraft. These conditions for fitness are considered from two very distinct aspects: fitness at the time of admission of flying personnel, and fitness upon reexamination and after air accidents. S L

**N82-29890#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**VERTEBRAL ARTHRITIS**

*In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 290-295

Avail NTIS HC A15/MF A01

Vertebral arthritis is a commonly encountered disorder that rarely affects the fitness of flying personnel. Factors that are considered are the roles in which the flying duties impose a stress upon the spine: these mainly comprise helicopter and combat pilots. The painful functional disturbance unrelated to radiological signs, radiologically, severe involvement of the discs, and therapeutic considerations, which under favorable conditions do not exclude surgery are also emphasized. S L

**N82-29891#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**ANKYLOSING SPONDYLITIS**

*In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 296-300

Avail NTIS HC A15/MF A01

The question of fitness of aircraft pilots in relation to the onset of ankylosing spondylitis is discussed. The clinical form of the disease and the nature of its course are considered. Factors emphasized are specific roles, such as helicopters or combat aircraft, fixed rigidity of the spine and, even more, deformity, extraspinous involvement, severe inflammatory syndromes, the prospect of rapid development, the recognition of a specific aetiology and the requirements of treatment. S L

**N82-29892#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)

**MEDICO-LEGAL ASPECT OF SPINAL DISORDERS IN AVIATION MEDICINE**

P Doury, R Auffret, and R P Delahaye *In its* Physiopathol and Pathol of Spinal Injuries in Aerospace Med Feb 1982 p 301-307

Avail NTIS HC A15/MF A01

Medico-legal aspects of spinal disorders in aviation medicine are discussed. Trauma and intervertebral arthritis, trauma and inflammatory rheumatic conditions and spondylolisthesis and its association with trauma are considered. S L

**N82-29893#** Instructional Science and Development Inc, San Diego, Calif

**POTENTIAL APPLICATIONS OF COMPUTER-ASSISTED INSTRUCTION TO P-3 AIRCREW TRAINING. Final Report, Aug 1979 - Feb 1980**

Linda J Mark, William W Hawkins, and H Dewey Kribs, San Diego, Calif. Navy Personnel Research and Development Center Mar 1982 43 p

(Contract N66001-79-C-0295)

(AD-A113491, NPRDC-SR-82-18, Rept-14-80-17) Avail NTIS HC A03/MF A01 CSCL 09/2

An investigation was undertaken to examine the recently revised P-3 aircrew training syllabus at Patrol Squadron 31 to identify the potential contributions that could be made to training effectiveness by a shift to computer-assisted instruction (CAI). Five areas representing the range of potential applications were examined. The characteristics of existing and potential computer-based systems were reviewed, and recommendations for applications to P-3 aircrew training were made.

Author (GRA)

**N82-29894#** Navy Personnel Research and Development Center, San Diego, Calif

**INSTRUCTOR'S ROLE IN INDIVIDUALIZED TRAINING. A SURVEY OF TWO COMPUTER MANAGED COURSES. Final Report, Jul 1975 - Sep. 1978**

Kirk A Johnson and Linda L Graham, May 1982 46 p (ZF55522002)

(AD-A114917, NPRDC-TR-82-45, Rept-14-79-4) Avail NTIS HC A03/MF A01 CSCL 05/9

Detailed records were made of instructor behavior in two Navy courses taught by means of individualized instruction. There were five specialized jobs in one course and six in the other. The jobs within each course differed considerably from one another in (1) the kinds and patterns of activities and (2) the total demands on the instructor. Most of the specialized jobs found in one course had nominal parallels in the other course, but the activities observed in these parallel jobs were frequently quite different.

Author (GRA)

**N82-29895#** National Academy of Sciences - National Research Council, Washington, D C. Div of Health Sciences Policy

**AIRLINE PILOT AGE, HEALTH, AND PERFORMANCE. SCIENTIFIC AND MEDICAL CONSIDERATIONS**

National Academy Press, Jul 1981 170 p refs

(Contract N01-AG-O-2112)

(PB82-161506, ISBN-0-309-03176-1, LC-81-82029) Avail NTIS HC A08/MF A01 CSCL 051

A comprehensive review is presented of current knowledge about biomedical and behavioral factors that might influence the ability of airline pilots to carry out their job safely as they advance in age. GRA

**N82-29896\*#** Southwest Research Inst, San Antonio, Tex. **A FUNCTIONAL VIDEO-BASED ANTHROPOMETRIC MEASURING SYSTEM. Final Report**

J H Nixon and J P Cater, 28 May 1982 78 p

(Contract NAS9-16158, SwRI Proj 16-6141)

(NASA-CR-167637, NAS 126 167637) Avail NTIS HC A05/MF A01 CSCL 06B

A high-speed anthropometric three dimensional measurement system using the Selcom Selspot motion tracking instrument for visual data acquisition is discussed. A three-dimensional scanning system was created which collects video audio, and performance data on a single standard video cassette recorder. Recording rates of 1 megabit per second for periods of up to two hours are possible with the system design. A high-speed off-the-shelf motion analysis system for collecting optical information as used. The video recording adapter (VRA) is interfaced to the Selspot data acquisition system. Author

**N82-29897\*#** California Univ, Berkeley, Dept of Mechanical Engineering

**AN APPROACH TO THE PRELIMINARY EVALUATION OF CLOSED ECOLOGICAL LIFE SUPPORT SYSTEM (CELSS) SCENARIOS AND CONTROL STRATEGIES**

J D Stahr, D M Auslander, R C Spear, and G E Young  
Jul 1982 46 p refs  
(Contract NCC2-67)  
(NASA-CR-166368, NAS 1 26 166368) Avail NTIS  
HC A03/MF A01 CSCL 06K

Life support systems for manned space missions are discussed. A scenario analysis method was proposed for the initial step of comparing possible partial or total recycle scenarios. The method is discussed in detail. R J F

**N82-29898\*# Life Systems, Inc. Cleveland, Ohio  
PREPROTOTYPE INDEPENDENT AIR REVITALIZATION SUBSYSTEM Final Report**

F H Schubert, Hallick, and R R Woods Apr 1982 92 p refs

(Contract NAS9-15218)  
(NASA-CR-167703, NAS 1 26 167703, LSI-TR-319-4) Avail  
NTIS HC A05/MF A01 CSCL 06K

The performance and maturity of a preprototype, three-person capacity, automatically controlled and monitored, self-contained independent air revitalization subsystem were evaluated. The subsystem maintains the cabin partial pressure of oxygen at 22 kPa (3.2 psia) and that of carbon dioxide at 400 Pa (3 mm Hg) over a wide range of cabin air relative humidity conditions. Consumption of water vapor by the water vapor electrolysis module also provides partial humidity control of the cabin environment. During operation, the average carbon dioxide removal efficiency at baseline conditions remained constant throughout the test at 84%. The average electrochemical depolarized concentrator cell voltage at the end of the parametric/endurance test was 0.41 V, representing a very slowly decreasing average cell voltage. The average water vapor electrolysis cell voltage increased only at a rate of 20 mV/h from the initial level of 1.67 V to the final level of 1.69 V at conclusion of the testing. A R H

**N82-29899\*# National Bureau of Standards, Washington D C  
Industrial Systems Div**

**AN OVERVIEW OF EXPERT SYSTEMS**

William B Gevarter May 1982 73 p Sponsored by NASA  
(NASA-CR-169197, NAS 1 26 169197, NBSIR-82-2505) Avail  
NTIS HC A04/MF A01 CSCL 05H

An expert system is defined and its basic structure is discussed. The knowledge base, the inference engine, and uses of expert systems are discussed. Architecture is considered, including choice of solution direction, reasoning in the presence of uncertainty, searching small and large search spaces, handling large search spaces by transforming them and by developing alternative or additional spaces, and dealing with time. Existing expert systems are reviewed. Tools for building such systems, construction, and knowledge acquisition and learning are discussed. Centers of research and funding sources are listed. The state-of-the-art, current problems, required research, and future trends are summarized. N W

**N82-29900\*# Air Force Flight Test Center, Edwards AFB, Calif  
QUANTIFICATION OF PILOT WORKLOAD VIA INSTRUMENT SCAN**

J R Tole (MIT), A T Stephens (Worcester Polytechnic Inst.), R L Harris (Boeing Co Renton, Wash) and A Ephrath (Bell Telephone Labs, Inc Piscataway, NY) 21 Jan 1982 17 p refs Presented at and AIAA Workshop on Flight Testing to Identify Pilot Workload and Pilot Dyn, Edward AFB, Calif 19-21 Jan 1982

(Contracts NcC1-23 NcC1-56)  
(NASA-CR-169238, NAS 1 26 169238) Avail NTIS  
HC A02/MF A01 CSCL 05H

The use of visual scanning behavior as an indicator of pilot workload is described. The relationship between level of performance on a constant piloting task under simulated IFR conditions, the skill of the pilot, the level of mental workload induced by an additional verbal task imposed on the basic control task, and visual scanning behavior is investigated. An increase in fixation dwell times, especially on the primary instrument with increased mental loading is indicated. Skilled subjects 'stared' less under increased loading than did novice pilots. Sequences of instrument fixations were also examined. The percentage occurrence of the subjects' most used sequences decreased with increased task difficulty for novice subjects but not for

highly skilled subjects. Entropy rate (bits/sec) of the sequence of fixations was also used to quantify the scan pattern. It consistently decreased for most subjects as the four loading levels used increased. S L

**N82-29901# Massachusetts Inst of Tech, Cambridge Artificial Intelligence Lab**

**WORKSHOP ON THE DESIGN AND CONTROL OF DEXTEROUS HANDS**

John M Hollerbach Apr 1982 22 p refs Workshop held at Cambridge, Mass, 5-6 Nov 1981

(Contract N00014-81-K-0494)  
(AD-A114973 AI-M-661) Avail NTIS HC A02/MF A01 CSCL 06/4

The workshop for the Design and Control of Dexterous Hands was held at the MIT Artificial Intelligence Laboratory on November 5-6, 1981. Outside experts were brought together to discuss four topics: kinematics of hands, actuation and materials, touch sensing and control. This report summarizes the discussions of the participants and attempts to identify a consensus on applications, mechanical design and control. Author (GRA)

**N82-29902# Virginia Polytechnic Inst and State Univ, Blacksburg Lab of Human Factors**

**HUMAN/COMPUTER TRANSACTION TASKS: AN ANNOTATED BIBLIOGRAPHY**

John G Casali May 1982 93 p  
(Contract N00123-77-C-1081, ZF55521001)  
(AD-A114800 NPRDC-TN-82-14, Rept-17-82-6) Avail NTIS  
HC A05/MF A01 CSCL 09/2

An annotated bibliography of references relating to human/computer transactions is provided. Operator-analyst and software programmer roles are represented by the majority of the references. Topics covered include display formatting, error modeling, performance assessment, query languages, keyboard and data entry, data organization, and speech input/output. Author

**N82-29903# Carnegie-Mellon Univ, Pittsburgh, Pa Robotics Inst**

**CONTROL OF A DIRECT-DRIVE ARM**

Haruhiko Asada, Takeo Kanade, and Ichiro Takeyama 9 Mar 1982 37 p refs

(Contract N00014-81-K-0503)  
(AD-A114969 CMU-RI-TR-82-4) Avail NTIS  
HC A03/MF A01 CSCL 13/9

A direct-drive arm is a new mechanical arm in which the shafts of articulated joints are directly coupled to the rotors of high performance torque motors. Since the arm does not contain any gears or transmission mechanisms between the motors and their loads, the drive systems have no backlash, small friction and high mechanical stiffness, all of which are desirable for fast, accurate and versatile robots. This paper presents the characteristic analysis and the design of the control system. GRA

**N82-30275# Joint Publications Research Service, Arlington, Va**

**MEDICAL-BIOLOGICAL INVESTIGATIONS UNDER SPACE CONDITIONS: PRESENT AND FUTURE SIGNIFICANCE**

H Fritze In its USSR Rept Space, No 16 (JPRS-81359) 26 Jul 1982 p 22-24 Transl into ENGLISH from Z Militaermed (East Germany), no 2, Apr 1981 p 51-52

Avail Issuing Activity

Weightlessness and cosmic radiation are discussed in terms of their medical and biological effect. Psychological factors are also considered. N W

**N82-30276# Joint Publications Research Service, Arlington, Va**

**TWENTY YEARS OF MANNED SPACE FLIGHT FROM THE VIEWPOINT OF SPACE MEDICINE**

H Haase In its USSR Rept Space, No 16 (JPRS-81359) 26 Jul 1982 p 25-43 refs Transl into ENGLISH from Z Militaermed (East Germany), no 2, Apr 1981 p 52-60

Avail Issuing Activity

Preparation for the first manned space flight is reviewed. The flight itself is summarized from the point of view of space medicine. Women in space and extravehicular activity are also discussed. N W

**N82-30277#** Joint Publications Research Service, Arlington, Va

**INITIAL AUDIOMETRIC INVESTIGATIONS IN AN ORBITAL STATION**

W Proehl, R Mocker, Ya Yakovleva, I I Bryanov, and M V Nefedova *In its* USSR Rept Space, No 16 (JPRS-81359) 26 Jun 1982 p 44-49 refs Transl into ENGLISH from Z Militaermed (East Germany), no 2 Apr 1981 p 60-62

**Avail Issuing Activity**

Audiometric investigations were conducted for the first time in an orbital station. The filter audiometer and the precision sound impulse level measuring instrument, used during audiometric measurements in the station, are described and the audiograms of three measurements by both cosmonauts are described. No major deviations from the norm were found. Author

**N82-30278#** Joint Publications Research Service, Arlington, Va

**INTRACUTANEOUS PARTIAL OXYGEN PRESSURE (pO<sub>2</sub> SUB ic) IN MAN DURING SHORT-TERM SPACE FLIGHTS: RESULTS OF JOINT USSR-GDR SPACE FLIGHT**

H Haase, E A Kovalenko, A Vacek, M P Bobrovnikskiy, B Jarsumbeck, and V N Sementsov *In its* USSR Rept Space, No 16 (JPRS-81359) 26 Jul 1982 p 50-57 refs Transl into ENGLISH from Z Militaermed (East Germany), no 2, Apr 1981 p 63-65

**Avail Issuing Activity**

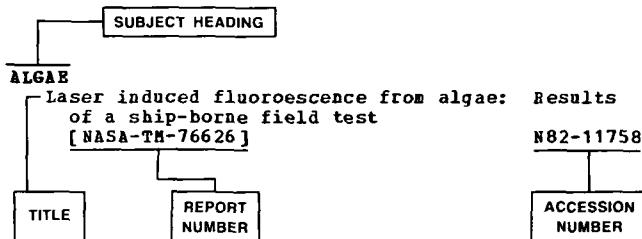
The results of the Kislород/Oxygen experiment are presented. The partial intracutaneous oxygen pressure (PIOP) was determined polarographically. The measurement probe used was an uncovered platinum puncture electrode. In the spaceship engineer, the PIOP during space flight had dropped by 19 mm Hg and local oxygen utilization had gone down by 4 mm Hg. During the hyperventilation test, during the first few days after the space flight, the spaceship commander only had a minor increase while the engineer and no increase in the PIOP. The results are preliminary. They agree well with the measurements on other spaceship crews. Author

# SUBJECT INDEX

AEROSPACE MEDICINE AND BIOLOGY / A Continuing Bibliography (Suppl. 238)

NOVEMBER 1982

## Typical Subject Index Listing



The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of the document content, a title extension is added, separated from the title by three hyphens. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

## A

### ABILITIES

On models and methods for performance measurement  
[AD-A113578] N82-28998

### ABIOTENESIS

Abiogenic synthesis of the peptide bond. II  
N82-39426

Abiogenic synthesis of the peptide bond. I  
N82-39448

The radiolysis of aqueous propionitrile -  
Compounds of interest to chemical evolution  
studies  
N82-41197

Formation of the thioester, N-acetyl,  
S-lactoylcysteine, by reaction of  
N-acetylcysteine with pyruvaldehyde in aqueous  
solution --- in prebiotic evolution  
N82-41200

### ABSORPTIVITY

An attempt at the classification of 'patient  
pharmacokinetic capacities'  
N82-38562

### ACCELERATION STRESSES (PHYSIOLOGY)

Aerobatics in light aircraft - Sensations and  
stresses experienced by the pilot  
N82-38848

Medico-physiological aspects of stunt-flying  
N82-38849

In-flight incapacitation and pathology for the  
light aircraft stunt-flyer  
N82-38851

Vestibular screening of cosmonauts  
N82-38853

Proceedings of a Meeting of the IUPS Commission on  
Gravitational Physiology --- Book  
N82-40649

Receptors signaling gravity orientation in an insect  
N82-40668

Cardiovascular responses of the chronically  
instrumented monkey during simulated space flight  
N82-40670

Effects of high-G on ventilation/perfusion in the  
domestic fowl  
N82-40672

The effects of +G2 acceleration stress on right  
ventricular pressures in conscious miniature  
swine.  
N82-40676

The effect of G sub 2 acceleration on pulmonary  
perfusion in the miniature swine  
N82-40681

Instantaneous stroke volume in man during lower  
body negative pressure /LBNP/  
N82-40683

Simulated gravitational field influences on the  
aging process  
N82-40685

Relations between respiratory and circulatory  
control during gravitational load in man  
N82-40714

Some of biochemical parameters in rat brain during  
+Gz acceleration  
N82-40717

Alterations in heat loss and heat production  
mechanisms in rat exposed to hypergravic fields  
N82-40718

Involuntary and voluntary mechanisms for  
preventing cerebral ischemia due to positive  
/Gz/ acceleration  
N82-40747

Embryonic development during chronic acceleration  
N82-40755

Cardiac and cerebral vascular adaptation to  
gravitational stresses in man  
N82-40765

Chronic acceleration and brain density  
N82-40769

Temperature and behavioral responses of squirrel  
monkeys to 2Gz acceleration  
N82-40774

USSR report. Space biology and aerospace  
medicine, volume 16, no. 3, May - June 1982  
[JPRS-81197] N82-28949

Problem of accelerations in aviation medicine  
N82-28950

Endurance of +Gz G forces by middle-aged people  
before and after 7-day immersion  
N82-28958

Spinal stresses in flight  
N82-29873

Ejection of pilots from combat aircraft  
N82-29877

Fractures of the spine in flight  
N82-29880

Accidents in centrifuges and experiments (ejection  
seat training towers, sleds)  
N82-29881

### ACCELERATION TOLERANCE

Study of high-g effects in animals  
N82-40651

Effect of physical training in cool and hot  
environments on +Gz acceleration tolerance in  
women  
N82-40664

Effect of baroreceptor denervation on +G sub 2  
tolerance in dogs  
N82-40675

Gravitational adaptation of animals  
N82-40716

Effect of sustained Gz acceleration on lung fluid  
balance - An ultrastructural study  
N82-40761

Cardiac and cerebral vascular adaptation to  
gravitational stresses in man  
N82-40765

### ACCIDENTS

Central nervous dysfunctions after near-miss  
accidents in diving  
N82-40443

### ACID BASE EQUILIBRIUM

Acid-base, metabolic, and ventilatory responses to  
repeated bouts of exercise  
N82-41219



## ACIDS

Domestic swine in physiological research. 3:  
Blood gas and acid-base values of arterial and  
venous blood from young anesthetized pigs  
maintained under steady-state ventilatory  
conditions  
[AD-A111834] N82-28945

## ACIDS

A comparison between the protonophoric and  
separating functions of weak dibasic acids ---  
in mitochondrial respiration A82-38590

## ACROBATICS

Aerobatics in light aircraft - Sensations and  
stresses experienced by the pilot A82-38848  
Medico-physiological aspects of stunt-flying A82-38849  
In-flight incapacitation and pathology for the  
light aircraft stunt-flyer A82-38851

## ACTIVATED CARBON

The utilization of macromolecules in blood  
purification systems  
[NRC/CNR-TT-2021] N82-29864

## ACTIVATION (BIOLOGY)

The effect of hyperactivation of the anterior  
amygdaloid nucleus on heart activity during  
states of altered reactivity A82-40454

Human lymphocyte activation is depressed at low-g  
and enhanced at high-g A82-40658

Effect of spaceflight on lymphocyte stimulation  
A82-40700

## ACTIVITY (BIOLOGY)

Functional properties of T-lymphocytes in patients  
with acute myocardial infarction A82-41459

Myosatelloocytes and cambial properties of skeletal  
and muscular tissue A82-41469

## ACTIVITY CYCLES (BIOLOGY)

Biorhythms of rats during and after space flight  
A82-40692

## ADAPTATION

Changes in man's constant electric field in the  
course of adaptation to hypokinesia A82-38595

Rapid perceptual adaptation to high  
gravito-inertial force levels Evidence for  
context-specific adaptation A82-40436

State of adaptation in patients with hypertension  
A82-40476

Aspects of cardiovascular adaptation to  
gravitational stresses A82-40687

Adaptation to weightlessness and its physiological  
mechanisms - Results of animal experiments  
aboard biosatellites A82-40688

Physiological mechanisms of adaptation of rat  
skeletal muscles to weightlessness and similar  
functional requirements A82-40689

Weightlessness effects on resistance and  
reactivity of animals A82-40690

Gravitational adaptation of animals A82-40716

Metabolic and cardiovascular adaptations in  
trained hypophysectomized rats A82-41215

Sleep, circadian cycles of physiological functions  
and parameters of human work capacity on first  
day after changing from altered to usual  
sleep-waking cycle N82-28951

Human external respiration and gas exchange in  
acute period of adaptation to immersion in water  
N82-28959

Adaptive motivation theory  
[AD-A111195] N82-28997

Attenuation of radioprotective effects of acute  
hypoxia on animals adapted to high altitudes  
N82-29855

## SUBJECT INDEX

## ADENOSINE TRIPHOSPHATE

The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase A82-38591

Specificity of action of monovalent cations on the  
ATPase activity of myosin HMM-S-1 A82-38594

Acridine orange inhibition of the ATPase activity  
of myosin and its fragments A82-38613

Reactions of O-18 exchange in the myosin systems  
of skeletal, cardiac, and smooth muscles A82-38614

The effect of monovalent cations on the ATPase  
activity and superprecipitation of actomyosin  
A82-38615

## ADRENAL GLAND

The gradualness of the reaction of the  
pituitary-adrenocortical system to activating  
and inhibiting signals A82-40315

## ADRENAL METABOLISM

The rate at which exogenous hydrocortisone is  
eliminated from peripheral blood flow in  
patients suffering from an acute myocardial  
infarction A82-41498

## ADRENERGICS

The effect of hypokinesia on the resistance of the  
heart to hypoxia A82-40502

## ADRENOCORTICOTROPIN (ACTH)

Role of hormonal compounds in regulation of  
electrolyte metabolism in the presence of  
emotional stress N82-28952

## ADSORBENTS

The utilization of macromolecules in blood  
purification systems  
[NRC/CNR-TT-2021] N82-29864

## ADSORPTION

Thermodynamic parameters characterizing  
interaction between polymer-absorbed ligand  
molecules A82-38609

## AEROBES

Evolution of major metabolic innovations in the  
Precambrian A82-38121

Determination of maximal aerobic power during  
upper body exercise  
[AD-A111712] N82-29866

## AEROEMBOLISM

Vibration and decompression gas bubbles  
A82-40729

## AEROSPACE ENVIRONMENTS

Intracutaneous partial oxygen pressure (pO<sub>2</sub> sub  
ic) in man during short-term space flights:  
Results of joint USSR-GDR space flight N82-30278

## AEROSPACE MEDICINE

The nature and rate of occurrence of medical  
emergencies on board Air France aircraft A82-38841

Physiological stresses linked to flight on airliners  
A82-38842

Medical emergencies in flight - Pathogenic aspects  
A82-38843

Medical emergencies on board an airliner -  
Procedures when a doctor is on board A82-38844

Medical emergencies on board airliners -  
Procedures in the absence of a doctor A82-38845

Medical emergencies on board airliners - Ground  
management A82-38846

Standards of physical condition for private pilots  
of aircraft and gliders A82-38847

Medico-physiological aspects of stunt-flying  
A82-38849

Physiological stresses in flying a sailplane  
A82-38850

In-flight incapacitation and pathology for the  
light aircraft stunt-flyer A82-38851

# SUBJECT INDEX

# ALDOSTERONE

- The clinical selection of astronauts at the C.P.E.M.P.N A82-38852
- Vestibular screening of cosmonauts A82-38853
- Orthostatic tests during cosmonaut selection A82-38854
- Proceedings of a Meeting of the IUPS Commission on Gravitational Physiology --- Book A82-40649
- Methodological aspects of future cardiovascular research in space A82-40652
- International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980, Proceedings A82-40686
- Relations between respiratory and circulatory control during gravitational load in man A82-40714
- USSR report. Space biology and aerospace medicine, volume 16, no. 3, May - June 1982 [JPRS-81197] N82-28949
- Biomedical research publications: 1980 - 1982 [NASA-CR-3587] N82-29848
- Electrometric investigation of human gustatory analyzer under normal conditions and in simulated weightlessness N82-29859
- Neurochemical background and approaches in the understanding of motion sickness [NASA-CR-3569] N82-29865
- Physiopathology and pathology of spinal injuries in aerospace medicine [AGARD-AG-250 (ENG)] N82-29870
- Medical-biological investigations under space conditions: Present and future significance N82-30275
- Twenty years of manned space flight from the viewpoint of space medicine N82-30276
- AFFERENT NERVOUS SYSTEMS**
- The effect of the electrical stimulation of afferent pathways on neurons in septal slices A82-40469
- Afferent associative and commissural projections of the cortical vestibular zone VI of cats A82-40495
- AGE FACTOR**
- On the mathematical modelling of microbial age dynamic and some control aspects of microbial growth processes A82-38823
- Age changes in the cerebral cortex of humans and cats /A comparative electron-microscopical investigation/ A82-40496
- Endurance of +Gz G forces by middle-aged people before and after 7-day immersion N82-28958
- Airline pilot age, health, and performance: Scientific and medical considerations [PB82-161506] N82-29895
- AGING (BIOLOGY)**
- Aging and visual function of military pilots - A review A82-40435
- Simulated gravitational field influences on the aging process A82-40685
- Airline pilot age, health, and performance: Scientific and medical considerations [PB82-161506] N82-29895
- AIR CARGO**
- Aircraft and crew scheduling during airlift operations [AD-A114114] N82-29011
- AIR COOLING**
- Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments A82-40440
- AIR LAW**
- Standards of physical condition for private pilots of aircraft and gliders A82-38847
- AIR PURIFICATION**
- Subjective response to negative air ion exposure A82-40446
- Modification of method for assaying ozone by the diacetyl dihydrolutidine reaction N82-28973
- AIR QUALITY**
- Modification of method for assaying ozone by the diacetyl dihydrolutidine reaction N82-28973
- Preprototype independent air revitalization subsystem [NASA-CR-167703] N82-29898
- AIRCRAFT ACCIDENTS**
- Human factor and flight safety A82-40885
- Theories of the pathogenesis of fractures of the spine N82-29874
- Aetiology and pathogenesis --- traumatic lesions of the spine N82-29875
- Helicopter accidents N82-29876
- Fractures of the spine in flight N82-29880
- Radiology of spinal trauma in aviation medicine N82-29883
- Analytical study of traumatic lesions of C3-C7 N82-29884
- Radiological study of fractures of C1 and C2 N82-29885
- Sequelae of vertebral fractures and trauma N82-29886
- AIRCRAFT CONTROL**
- Psychological investigation of pilot behavior during integration of control systems in the cockpit of passenger airliners --- German thesis A82-40560
- AIRCRAFT FUELS**
- An industrial hygiene evaluation of aircraft refueling inside closed aircraft shelters at elevated ambient temperatures [AD-A114396] N82-28994
- AIRCRAFT MANEUVERS**
- Aerobatics in light aircraft - Sensations and stresses experienced by the pilot A82-38848
- Medico-physiological aspects of stunt-flying A82-38849
- AIRCRAFT PILOTS**
- Standards of physical condition for private pilots of aircraft and gliders A82-38847
- Problem of accelerations in aviation medicine N82-28950
- Development of a methodology for assessing aircrew workloads [AD-A114364] N82-29010
- Ejection of pilots from combat aircraft N82-29877
- Fractures of the spine in flight N82-29880
- Backache in helicopter pilots N82-29887
- The cervical column of pilots of combat aircraft N82-29888
- The spine and fitness for flight N82-29889
- Vertebral arthritis N82-29890
- Ankylosing spondylitis N82-29891
- Medico-legal aspect of spinal disorders in aviation medicine N82-29892
- Airline pilot age, health, and performance: Scientific and medical considerations [PB82-161506] N82-29895
- Quantification of pilot workload via instrument scan [NASA-CR-169238] N82-29900
- ALDEHYDES**
- Selecting optimal conditions for heart conservation in weak aldehyde solutions by using mathematical methods of experimental design A82-38534
- ALDOSTERONE**
- Relevance of aldosterone on circulatory, renal and blood reactions during simulated weightlessness and on aerobic metabolic rate A82-40736

## ALGORITHMS

Role of hormonal compounds in regulation of electrolyte metabolism in the presence of emotional stress

A82-28952

## ALGORITHMS

Increasing the efficiency of running on the basis of learning algorithms and information tools

A82-40488

## ALTITUDE ACCLIMATIZATION

The characteristics of hemodynamic shifts under physical stress at mountain elevations

A82-38166

Study of RNA synthesis rate and DNA content in the myocardium of new-born rats during adaptation to high-altitude hypoxia

A82-38537

Prevention of heart function abnormalities during reoxygenation after ischemia by adaptation to altitude hypoxia

A82-40455

Altitude-induced changes in plasma thyroxine, 3,5,3 prime-triiodothyronine, and thyrotropin in rats

A82-41207

## ALTITUDE SIMULATION

The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats

A82-40713

## ALTITUDE TOLERANCE

The effect of hypokinesia on the resistance of the heart to hypoxia

A82-38170

The participation of the lymphatic system in the resistance of an organism to hypoxia

A82-39793

## ALVEOLI

Changes in mineralized tissues in the case of calcitonin and somatotrophic hormone injections under hypokinesia

A82-40503

## AMBIENT TEMPERATURE

Task categorization and the limits of human performance in extreme heat

A82-40439

Skin temperature and thermal comfort in weightlessness

A82-40726

Effect of high ambient temperature on carbohydrate metabolism in rat liver and skeletal muscles

A82-28975

## AMBIGUITY

Ambiguity and the evolution of the genetic code

A82-38120

## AMINES

The effect of repeated episodes of emotional stress on heart activity and the content of monoamines in the heart

A82-38163

## AMINO ACIDS

The changes in the concentration of free amino acids in muscles during exercise

A82-40314

Rhythms of electrolytes and hydroxyproline excretion in urine of rats after three weeks of weightlessness - Biosatellite Cosmos-1129

A82-40693

Molecular basis for the genetic code

A82-41195

## ANOBARBITAL

An attempt at the classification of 'patient pharmacokinetic capacities'

A82-38562

## AMPHETAMINES

Neurochemical background and approaches in the understanding of motion sickness

A82-29865

## ANAEROBES

Evolution of major metabolic innovations in the Precambrian

A82-38121

## ANATOMY

Segmentation and analysis of stereophotometric body surface data

A82-29868

## ANIMALS

Study of high-g effects in animals

A82-40651

## SUBJECT INDEX

## ANTARCTIC REGIONS

Mycelial fungi, isolated from the ice sheet of the central Antarctic

A82-39428

The microflora of the central Antarctica glacier and control methods for the sterile isolation of an ice core for microbiological analyses

A82-39430

## ANTHROPOMETRY

Simulation of the motion of the center of mass of an occupant under ejection accelerations

[AD-A113806] A82-28989

A functional video-based anthropometric measuring system

[NASA-CR-167637] A82-29896

## ANTIBIOTICS

Effect of the combined administration of antibiotic-resistant bifidobacteria and the corresponding antibiotics on the survival of irradiated mice

A82-38581

The mechanism of the microwave effect on the conductivity of bilayer lipid membranes

A82-38587

Gramicidin A-induced conductance of the muscle fiber membrane

A82-38605

Occult bacterial persistence and resistance to colonization after antibiotic therapy

A82-40460

## ANTIDIURETICS

ADH suppression under immersion combined with dehydration --- antidiuretic hormone secretion

A82-40776

## ANTIPOULING

Technical assessment of the prevention of micro-fouling on OTEC heat-transfer surfaces through the use of ultraviolet radiation

[DE82-005489] A82-29850

## ANTIHYPERTENSIVE AGENTS

The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity

A82-40763

Cardiovascular effects of Clonidine during 20 hours head down tilt /-5 deg/

A82-40764

## ANTIOXIDANTS

Features of microcirculatory hemostasis and of the clotting and fibrinolytic properties of blood and the activity of the antioxidant system in people of various ABO blood groups

A82-38164

Protection from O2 toxicity by preexposure to hypoxia - Lung antioxidant enzyme role

A82-41217

## ANXIETY

Adapting a scale for measuring competition anxiety

A82-40450

## AORTA

RNA-content distribution of cells from the normal and atherosclerotic human aorta

A82-38535

Aortic and tibial bloodflow response to lower body negative pressure /LBNP/

A82-40727

## AQUEOUS SOLUTIONS

Selecting optimal conditions for heart conservation in weak aldehyde solutions by using mathematical methods of experimental design

A82-38534

Attributing macroscopic fluctuations in aqueous solutions of proteins and other substances to the class of flicker noise

A82-38592

An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane

A82-38607

The radiolysis of aqueous propionitrile - Compounds of interest to chemical evolution studies

A82-41197

Formation of the thioester, N-acetyl, S-lactoylcysteine, by reaction of N-acetylcysteine with pyruvaldehyde in aqueous solution --- in prebiotic evolution

A82-41200

# SUBJECT INDEX

# ATTITUDE (INCLINATION)

## ARCTIC REGIONS

The effect of the natural and climatic conditions of the Far North on the human cardiovascular system  
A82-41466

## ARM (ANATOMY)

X-ray study of loaded skeletal portions in the upper extremities of athletes engaging in karate  
A82-40490  
Determination of maximal aerobic power during upper body exercise  
[AD-A111712]  
N82-29866

## AROUSAL

The physiological mechanisms of the arousal response in animals under conditions of hypobiosis  
A82-40311

## ARRHYTHMIA

Diagnostics of disturbances of heart rhythm and conductance and their professional evaluation in flight personnel  
A82-40309  
The effect of diethylamine analog of ethmazine on the functional condition of myocardium /Clinical and experimental study/  
A82-41488

## ARTERIES

The influence of the speed of blood flow in the carotid artery on the hematocrit of the blood being delivered to the brain  
A82-38550  
Effect of baroreceptor denervation on +G sub z tolerance in dogs  
A82-40675

## ARTERIOSCLEROSIS

RNA-content distribution of cells from the normal and atherosclerotic human aorta  
A82-38535  
State of adaptation in patients with hypertension  
A82-40476  
The use of an audio-frequency magnetic field in certain diseases  
A82-41473  
Immunological reactions to lipoproteins and heparin in young men with a hereditary tendency to atherosclerosis  
A82-41487  
The use of biochemical monitoring methods in the ergometry of patients with atherosclerosis  
A82-41494

## ARTHRITIS

The use of an audio-frequency magnetic field in certain diseases  
A82-41473  
Application of laser therapy to patients with osteoarthritis deformans  
A82-41475  
Vertebral arthritis  
N82-29890  
Medico-legal aspect of spinal disorders in aviation medicine  
N82-29892

## ARTIFICIAL GRAVITY

Artificial gravity in space flight  
A82-40691  
Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats  
A82-40723

## ARTIFICIAL INTELLIGENCE

An overview of expert systems --- artificial intelligence  
[NASA-CR-169197]  
N82-29899  
Workshop on the Design and Control of Dexterous Hands  
[AD-A114973]  
N82-29901

## ASCORBIC ACID

The assimilation of vitamin C in seamen during voyages at high latitudes  
A82-41465

## ASCORBIC ACID METABOLISM

The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones  
A82-38563

## ASSOCIATION REACTIONS

Higher integrative systems of the brain --- Russian book  
A82-40642

## ASTRONAUT PERFORMANCE

Gravitational scale effects --- moving organism performance as function of gravity and size  
A82-40650

## ASTRONAUT TRAINING

Selection and training of European astronauts  
A82-39507

## ASTRONAUTS

The clinical selection of astronauts at the C.P.E.M.P.N  
A82-38852  
Vestibular screening of cosmonauts  
A82-38853  
Orthostatic tests during cosmonaut selection  
A82-38854

## ATHLETES

Adapting a scale for measuring competition anxiety  
A82-40450  
An automated system for the collection and processing of cardiovascular information from athletes  
A82-40484  
Somatotypology and athletics  
A82-40486  
Psychic stress in athletic activity  
A82-40489  
Output and efficiency of the heart in young athletes as a function of the type of athletic training  
A82-41497  
Problems in the metrology of the training load of ski racers  
A82-41502  
Optimizing conditions for athletic activity with an allowance made for neurodynamic peculiarities /using bicycle sports as a model/  
A82-41503  
The speed of blood flow in athletes subjected to the combined action of a training regime and high-altitude climatic factors  
A82-41505  
Certain psychological and tactical aspects of athlete activities during competitions  
A82-41506

## ATMOSPHERIC COMPOSITION

Subjective response to negative air ion exposure  
A82-40446

## ATROPHY

Changes in mineralized tissues in the case of calcitonin and somatotrophic hormone injections under hypokinesia  
A82-40503  
Effect of immobilization on the nonhistone protein composition in different types of skeletal muscles  
A82-40711  
Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles  
A82-40712  
The effects of human growth hormone administration on the functional status of rat atrophied muscle following immobilization  
A82-40715  
Atrophy of rat skeletal muscles in simulated weightlessness  
A82-40738  
Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle  
A82-41209

## ATROPINE

Vegetative reactions to the administration of atropine and propranolol in rats that exhibit different types of behavior  
A82-40463

## ATTACK AIRCRAFT

Ejection of pilots from combat aircraft  
N82-29877

## ATTITUDE (INCLINATION)

Contrast influence on perceived orientation --- of gratings obtained by dichoptic fusion of two monocular images  
A82-38796  
Gravity and the tilt aftereffect --- comparison between monocular, binocular and interocular exposures  
A82-39440  
Short term gravity effects on volume homeostasis in man Assessment of transvascular fluid shifts after graded tilt  
A82-40760

## AUDIO FREQUENCIES

### AUDIO FREQUENCIES

The use of an audio-frequency magnetic field in certain diseases A82-41473

### AUDIOMETRY

Initial audiometric investigations in an orbital station N82-30277

### AUDITORY DEFECTS

Otoneurological symptoms and syndromes --- Russian book A82-39286

### AUDITORY PERCEPTION

Application of xylite for the detection of labyrinthine hydrops A82-39243  
An absolute threshold in psychoacoustics A82-40448

Characteristics of human auditory evoked potentials during the lateralization of a 'moving' auditory image A82-40465

### AUDITORY SIGNALS

Theoretical and practical aspects of using acoustic repellants to scare birds. Part 1: Interspecificity and geographic (regional) distinctions of acoustic repellants N82-29858

### AUDITORY STIMULI

Characteristics of human auditory evoked potentials during the lateralization of a 'moving' auditory image A82-40465  
Core temperature and brainstem auditory evoked potentials as complimentary noninvasive measures of central neural function during exposure to hypergravic fields A82-40772  
Effect of caloric stimulation of vestibular system on hearing N82-28963

### AUTOMATIC CONTROL

An automated system for the collection and processing of cardiovascular information from athletes A82-40484

### AUTONOMIC NERVOUS SYSTEM

Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration A82-40720

## B

### BACK INJURIES

Physiopathology and pathology of spinal injuries in aerospace medicine [AGARD-AG-250 (ENG)] N82-29870  
Theories of the pathogenesis of fractures of the spine N82-29874  
Aetiology and pathogenesis --- traumatic lesions of the spine N82-29875  
Helicopter accidents N82-29876  
Ejection of pilots from combat aircraft N82-29877  
Parachuting N82-29878  
Fractures of the spine in flight N82-29880  
Accidents in centrifuges and experiments (ejection seat training towers, sleds) N82-29881  
Clinical examination of spinal injuries N82-29882  
Radiology of spinal trauma in aviation medicine N82-29883  
Analytical study of traumatic lesions of C3-C7 N82-29884  
Radiological study of fractures of C1 and C2 N82-29885  
Sequelae of vertebral fractures and trauma N82-29886  
Backache in helicopter pilots N82-29887  
The cervical column of pilots of combat aircraft N82-29888

## SUBJECT INDEX

### BACTERIA

Effect of the combined administration of antibiotic-resistant bifidobacteria and the corresponding antibiotics on the survival of irradiated mice A82-38581  
Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria A82-39422  
Occult bacterial persistence and resistance to colonization after antibiotic therapy A82-40460

### BACTERICIDES

Occult bacterial persistence and resistance to colonization after antibiotic therapy A82-40460

### BALLOUT

Limits of human tolerance for impacts in free fall N82-29879

### BARORECEPTORS

Baroreflex regulation of hemodynamics under orthostatic effects /an investigation with a mathematical model/ A82-38162  
Effect of baroreceptor denervation on +G sub z tolerance in dogs A82-40675

### BED REST

Effects of prolonged bedrest in antiorthostatic position on rCBF measured by 133Xe inhalation technique - Effects of clonidine --- regional Cerebral Blood Flow A82-40743  
Cardiovascular effects of Clonidine during 20 hours head down tilt /-5 deg/ A82-40764

### BEHAVIOR

Vegetative reactions to the administration of atropine and propranolol in rats that exhibit different types of behavior A82-40463  
Higher integrative systems of the brain --- Russian book A82-40642  
Temperature and behavioral responses of squirrel monkeys to 2Gz acceleration A82-40774  
USSR report. Life sciences biomedical and behavioral sciences, no. 16 N82-28977  
[JPRS-80789]  
Orienting and exploratory behavior of gray rat in open field. Zoopsychological analysis N82-28981  
Theoretical and practical aspects of using acoustic repellants to scare birds. Part 1: Interspecificity and geographic (regional) distinctions of acoustic repellants N82-29858

### BENZENE POISONING

An industrial hygiene evaluation of aircraft refueling inside closed aircraft shelters at elevated ambient temperatures [AD-A114396] N82-28994

### BEVERAGES

The effectiveness of perspiration in a hot environment A82-38178

### BIBLIOGRAPHIES

Chemical evolution and the origin of life - Bibliography Supplement 1980 A82-38122  
Biomedical research publications: 1980 - 1982 [NASA-CR-3587] N82-29848  
Human/computer transaction tasks: An annotated bibliography [AD-A114800] N82-29902

### BINOCULAR VISION

Contrast influence on perceived orientation --- of gratings obtained by dichoptic fusion of two monocular images A82-38796  
Gravity and the tilt aftereffect --- comparison between monocular, binocular and interocular exposures A82-39440

**BIOACOUSTICS**

Histoenzymological changes in experimental animals exposed to variable noise

A82-38577

**BIOASSAY**

An attempt at the classification of 'patient pharmacokinetic capacities'

A82-38562

Modification of method for assaying ozone by the diacetyl dihydrolutidine reaction

N82-28973

**BIOASTRONAUTICS**

Mechanical chemical and bio-hazards --- space-probe related planet and earth contaminations

A82-39159

Space gastroenterology --- Russian book

A82-40643

Proceedings of a Meeting of the IUPS Commission on Gravitational Physiology --- Book

A82-40649

Methodological aspects of future cardiovascular research in space

A82-40652

Dynamics of weight loss during prolonged spaceflight

A82-40673

Effect of simulated weightlessness on energy metabolism in the rat

A82-40677

Effect of space flight on bone strength

A82-40680

International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980, Proceedings

A82-40686

Biorhythms of rats during and after space flight

A82-40692

Ultrastructural qualitative and quantitative evaluation of cytoplasmatic structures of heart muscle of rats living aboard biosputnik Kosmos 936

A82-40694

International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, September 29-October 2, 1981, Proceedings

A82-40734

Results of investigations of weightlessness effects during prolonged manned space flights onboard Salyut-6

A82-40750

Mechanisms of the effects of weightlessness on the motor system of man

A82-40752

Evidence for arrested bone formation during spaceflight

A82-40767

**BIOCHEMICAL OXYGEN DEMAND**

Relationship between muscle  $\text{Qo}_2$  and fatigue during repeated isokinetic contractions --- respiratory capacities

A82-41216

**BIOCHEMISTRY**

Changes in the microelement content of muscles under denervation

A82-38598

Conditions leading to kinetic and thermodynamic isotopic effects in a cell

A82-38601

Histamine in biochemistry and physiology --- Russian book

A82-39290

Neurochemical mechanisms of learning and memory --- Russian book

A82-40646

Body composition of rats flown aboard Cosmos-1129

A82-40695

Biochemical aspects of the mechanism by which cholinolytics affect the brain

A82-41468

The use of biochemical monitoring methods in the ergometry of patients with atherosclerosis

A82-41494

USSR report. Life sciences biomedical and behavioral sciences, no. 16

[JPRS-80789] N82-28977

Monograph on new direction of chemistry and biology of peptide and protein bioregulators reviewed

N82-28979

USSR report. Life sciences. Biomedical and behavioral sciences, no. 18

[JPRS-81428]

N82-29857

**BIOCLIMATOLOGY**

The effect of the natural and climatic conditions of the Far North on the human cardiovascular system

A82-41466

**BIOCONTROL SYSTEMS**

The cortical regulation of human motion --- Russian book

A82-39283

Systemic mechanisms of homeostasis

A82-39417

**BIODYNAMICS**

Gravitational scale effects --- moving organism performance as function of gravity and size

A82-40650

Dynamics of weight loss during prolonged spaceflight

A82-40673

Simulation of the motion of the center of mass of an occupant under ejection accelerations

[AD-A113806]

N82-28989

Task analysis and the ability requirements of tasks: Collected papers

[AD-A111181]

N82-29000

Biomechanical analysis of tasks involving manual materials handling

[AD-A113955]

N82-29009

Physiopathology and pathology of spinal injuries in aerospace medicine

[AGARD-AG-250 (ENG)]

N82-29870

Biomechanics of the spine

N82-29872

**BIOELECTRIC POTENTIAL**

Gramicidin A-induced conductance of the muscle fiber membrane

A82-38605

Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating

A82-38795

Characteristics of human auditory evoked potentials during the lateralization of a 'moving' auditory image

A82-40465

Changes of intracellular rest potential and the length of isolated muscle under different loads

A82-40480

Core temperature and brainstem auditory evoked potentials as complimentary noninvasive measures of central neural function during exposure to hypergravic fields

A82-40772

On the observability of electrical cardiac sources --- Thesis

A82-41450

**BIOELECTRICITY**

The impulse activity of neurons in the nodose ganglion during acute hemodynamic and respiratory disorders

A82-38546

Ion currents through a neuron membrane during the injection of cyclic nucleotides

A82-38588

Changes in man's constant electric field in the course of adaptation to hypokinesia

A82-38595

The conductivity of model protein-lipid membranes

A82-38604

The incorporation of an erythrocyte membrane into planar bilayer lipid membranes

A82-38606

Statistical analysis of neuronal impulse activity in the diencephalon during

immobilization-produced emotional stress in rats

A82-40467

The effect of the electrical stimulation of afferent pathways on neurons in septal slices

A82-40469

Dynamics of the brain electric activity in patients with cerebral insults under the effect of muscle stimulation with sinusoidal modulated currents

A82-41477

**BIOINSTRUMENTATION**

An improved apparatus for venous occlusion plethysmography

A82-38548



# BIOLOGICAL EFFECTS

# SUBJECT INDEX

On the observability of electrical cardiac sources  
 --- Thesis A82-41450  
 Microcalorimetry in biomedical investigations A82-41471  
 Sources of an artificial magnetic field for  
 implantation /experimental study/ A82-41480  
 A device for producing the action of static  
 magnetic fields on biological objects A82-41482  
 Implantable electrical device  
 [NASA-CASE-GSC-12560-1] N82-29863  
**BIOLOGICAL EFFECTS**  
 Nonthermal effect of nanosecond microwave pulses  
 on the transepithelial transport of sodium ions A82-38586  
 The flavin-dependent consumption of oxygen in  
 mitochondria under illumination A82-38589  
 A comparison between the protonophoric and  
 separating functions of weak dibasic acids ---  
 in mitochondrial respiration A82-38590  
 Acridine orange inhibition of the ATPase activity  
 of myosin and its fragments A82-38613  
 Cytogenetic effect of 5-fluoro-2desoxy uridine in  
 the G2 phase on intact and X-irradiated crepis  
 capillaris L cells A82-40461  
 Research opportunities and limitations of  
 protracted hypogravity simulations for plant  
 gravitational physiology A82-40653  
 Human lymphocyte activation is depressed at low-g  
 and enhanced at high-g A82-40658  
 Plasticity of fast and slow muscle myofibrillar  
 proteins in model experiments simulating  
 weightlessness A82-40709  
 Effect of immobilization on the nonhistone protein  
 composition in different types of skeletal muscles A82-40711  
 Atrophy of rat skeletal muscles in simulated  
 weightlessness A82-40738  
 Suppression of osteoblast differentiation during  
 weightlessness A82-40756  
 Clinostat exposure and symmetrization of  
 frog eggs A82-40757  
 The intracellular responses of frog eggs to novel  
 orientations to gravity A82-40758  
 Tritium oxide distribution and excretion kinetics  
 in the exposure of animals to noise A82-41463  
 A hygienic evaluation of the biological effects of  
 nonionizing microwave radiation A82-41464  
 The biological effects of repeated blasts  
 [AD-A113113] N82-28990  
 Theoretical and practical aspects of using  
 acoustic repellants to scare birds. Part 1:  
 Interspecificity and geographic (regional)  
 distinctions of acoustic repellants N82-29858  
 Superior heat-transfer fluids for solar heating  
 and cooling applications. Results of acute oral  
 toxicity determinations [DE82-003071] N82-29869  
**BIOLOGICAL EVOLUTION**  
 Clay and the origin of life A82-38115  
 Evolution of major metabolic innovations in the  
 Precambrian A82-38121  
 Chemical evolution and the origin of life -  
 Bibliography Supplement 1980 A82-38122  
 Cellular aspects of gravitational biology A82-40754  
 Embryonic development during chronic acceleration A82-40755  
 Evolution of early mechanisms of translation of  
 genetic information into polypeptides A82-41324

**BIOLOGICAL MODELS (MATHEMATICS)**  
 Baroreflex regulation of hemodynamics under  
 orthostatic effects /an investigation with a  
 mathematical model/ A82-38162  
 Selecting optimal conditions for heart  
 conservation in weak aldehyde solutions by using  
 mathematical methods of experimental design A82-38534  
 Thermodynamic parameters characterizing  
 interaction between polymer-absorbed ligand  
 molecules A82-38609  
 Absorption characteristics of prolate spheroidal  
 models exposed to the near fields of  
 electrically small apertures A82-38802  
 On the mathematical modelling of microbial age  
 dynamic and some control aspects, of microbial  
 growth processes A82-38823  
 Systemic mechanisms of homeostasis A82-39417  
 Model of the accommodative mechanism in the human  
 eye A82-39432  
 Modeling and simulation in the study of certain  
 biological systems A82-39570  
 Increasing the efficiency of running on the basis  
 of learning algorithms and information tools A82-40488  
 Gravitational scale effects --- moving organism  
 performance as function of gravity and size A82-40650  
 A new rat model simulating some aspects of space  
 flight A82-40655  
 Running in circles --- track radius effects on  
 human running speed A82-40661  
 Gravity sensing, polar transport and cytoplasmic  
 streaming in plant cells A82-40667  
 A new rat model for studies of hypokinesia and  
 antiorthostasis A82-40706  
 Gravity perception and asymmetric growth in plants  
 - A model derived from the grass pulvinus A82-40775  
 A nonlinear model combining pulmonary mechanics  
 and gas concentration dynamics A82-41230  
**BIOMAGNETISM**  
 The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase A82-38591  
 The influence of a constant magnetic field on the  
 epileptogenic foci in the hippocampus of rabbits A82-40466  
 Relation between physiological effects of  
 gravitational forces and that of magnetic  
 forces. II A82-40771  
 The use of an audio-frequency magnetic field in  
 certain diseases A82-41473  
 Sources of an artificial magnetic field for  
 implantation /experimental study/ A82-41480  
 Present-day magnetic-field sources, used in  
 medical treatment A82-41481  
**BIOMASS**  
 On the mathematical modelling of microbial age  
 dynamic and some control aspects of microbial  
 growth processes A82-38823  
**BIOMEDICAL DATA**  
 An automated system for the collection and  
 processing of cardiovascular information from  
 athletes A82-40484  
**BIOMETRICS**  
 A method of evaluating the functional state of the  
 central nervous system of a person performing work A82-38579

# SUBJECT INDEX

# BLOOD FLOW

- Determination of blood-lipoprotein dimensions by optical methods A82-38593
- An automated system for the collection and processing of cardiovascular information from athletes A82-40484
- Somatotypology and athletics A82-40486
- Problems in the metrology of the training load of ski racers A82-41502
- Telemetry methods for monitoring physiological parameters A82-41551
- BIOMICS**
- Systemic mechanisms of homeostasis A82-39417
- BIOPHYSICS**
- The thermal pulsation method in the study of several physiological mechanisms of the brain stem A82-38559
- A study of the mechanism governing the different types of behavior exhibited by the spiral excitation wave period in auricle and ventricle A82-38597
- A possible explanation for the fluctuations in reflectivity exhibited by bilayer lipid membranes excited during electrostriction A82-38602
- Light curves for photosynthesis under intermittent illumination A82-38608
- X-ray study of loaded skeletal portions in the upper extremities of athletes engaging in karate A82-40490
- Ultra-high impact free-fall survival A82-40684
- Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle A82-41209
- BIOSATELLITES**
- Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites A82-40688
- Rhythms of electrolytes and hydroxyproline excretion in urine of rats after three weeks of weightlessness - Biosatellite Cosmos-1129 A82-40693
- Results of morphological investigations aboard biosatellites Cosmos A82-40697
- BIOSYNTHESIS**
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-38169
- Study of RNA synthesis rate and DNA content in the myocardium of new-born rats during adaptation to high-altitude hypoxia A82-38537
- The incorporation of an erythrocyte membrane into planar bilayer lipid membranes A82-38606
- Abiogenic synthesis of the peptide bond. II A82-39426
- Metabolism of the thermophilic hydrogenous bacterium *Pseudomonas thermophila* K-2 A82-39427
- Abiogenic synthesis of the peptide bond. I A82-39448
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-40501
- Evolution of early mechanisms of translation of genetic information into polypeptides A82-41324
- BIOTECHNOLOGY**
- The microflora of the central Antarctica glacier and control methods for the sterile isolation of an ice core for microbiological analyses A82-39430
- USSR report. Life sciences. Biomedical and behavioral sciences, no. 17 [JPRS-81419] A82-29853
- USSR report. Life sciences. Biomedical and behavioral sciences, no. 18 [JPRS-81428] A82-29857
- BIOTELEMETRY**
- Telemetry methods for monitoring physiological parameters A82-41551
- BIRDS**
- Theoretical and practical aspects of using acoustic repellants to scare birds. Part 1: Interspecificity and geographic (regional) distinctions of acoustic repellants A82-29858
- BLADDER**
- Electrical stimulation of the urinary bladder following radical surgery for cancer of the rectum A82-41479
- BLAST LOADS**
- The biological effects of repeated blasts [AD-A113113] A82-28990
- BLOOD**
- Migration kinetics of hemopoietic stem cells in mice after severe mechanical trauma A82-38541
- Determination of blood-lipoprotein dimensions by optical methods A82-38593
- The toxic properties of rabbit and dog sera under controlled hyperthermia A82-40458
- Relevance of aldosterone on circulatory, renal and blood reactions during simulated weightlessness and on aerobic metabolic rate A82-40736
- Domestic swine in physiological research. 3: Blood gas and acid-base values of arterial and venous blood from young anesthetized pigs maintained under steady-state ventilatory conditions [AD-A111834] A82-28945
- The utilization of macromolecules in blood purification systems [NRC/CHR-TT-2021] A82-29864
- BLOOD CIRCULATION**
- Antithrostatic hypokinesia and circulation in the rat A82-40741
- The effect of the natural and climatic conditions of the Far North on the human cardiovascular system A82-41466
- The achievements of investigations carried out in the years 1976-1980 on the problem of insufficient blood circulation and heart rhythm disturbances A82-41501
- Reaction to diminished circulating blood volume in individuals who are susceptible and insusceptible to motion sickness (seasickness) A82-28960
- BLOOD COAGULATION**
- Features of microcirculatory hemostasis and of the clotting and fibrinolytic properties of blood and the activity of the antioxidant system in people of various ABO blood groups A82-38164
- Evidence of an immune mechanism of enzyme-hemostasis regulation A82-38552
- BLOOD FLOW**
- Local cerebral blood flow dynamics during experimental ischemia A82-38544
- The influence of the speed of blood flow in the carotid artery on the hematocrit of the blood being delivered to the brain A82-38550
- Prostaglandins and regulation of cerebral circulation under conditions of the altered gaseous composition of the blood A82-38561
- The response of the venous walls in the extremities to a disturbed venous outflow A82-40493
- The effect of G sub z acceleration on pulmonary perfusion in the miniature swine A82-40681

## BLOOD PLASMA

- Aortic and tibial bloodflow response to lower body negative pressure /LBNP/ A82-40727
- Reduction in renal artery blood flow impedance during upright tilt in man A82-40735
- Vestibular effects of water immersion and Clonidine A82-40762
- The rate at which exogenous hydrocortisone is eliminated from peripheral blood flow in patients suffering from an acute myocardial infarction A82-41498
- The role of the energy transport system in changes of the contractile function of the heart in the case of the measured limitation of coronary blood flow A82-41499

## BLOOD PLASMA

- A measurement of the size distribution of lipoproteins in the plasma of human blood A82-38603
- Space flight effects upon plasma and tissue lipids in rats A82-40722
- Short term gravity effects on volume homeostasis in man Assessment of transvascular fluid shifts after graded tilt A82-40760
- ADH suppression under immersion combined with dehydration --- antidiuretic hormone secretion A82-40776
- Altitude-induced changes in plasma thyroxine, 3,5,3 prime-triiodothyronine, and thyrotropin in rats A82-41207

## BLOOD PRESSURE

- Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system A82-40656
- The effects of +G2 acceleration stress on right ventricular pressures in conscious miniature swine. A82-40676

## BLOOD VESSELS

- The effect of leienkephalin and thyrosine on the lymphatic and blood microvessels A82-41490

## BLOOD VOLUME

- Changes in blood volume and response to vaso-active drugs in horizontally casted primates A82-40657
- Effects of lower body negative pressure on the reliability of cardiovascular system using X-ray kymograms A82-40728
- Reaction to diminished circulating blood volume in individuals who are susceptible and insusceptible to motion sickness (seasickness) A82-28960

## BODY COMPOSITION (BIOLOGY)

- The concentration of adenyly nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress A82-38560
- Dynamics of weight loss during prolonged spaceflight A82-40673
- Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness A82-40709
- Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization A82-40742
- Response of rat body composition to simultaneous exercise and centrifugation at 3.14g A82-40766
- Tritium oxide distribution and excretion kinetics in the exposure of animals to noise A82-41463

## BODY FLUIDS

- Computer simulations of postural change, water immersion and bedrest - An integrative approach for understanding the spaceflight response A82-40659

## SUBJECT INDEX

- Effect of sustained Gz acceleration on lung fluid balance - An ultrastructural study A82-40761
- Effects of low-intensity electromagnetic fields on human and animal erythrocytes A82-28974
- BODY SIZE (BIOLOGY)**
- Gravitational scale effects --- moving organism performance as function of gravity and size A82-40650
- Gravity, metabolic rate and body size of mammals A82-40678
- BODY SWAY TEST**
- Postural control related to the different tilting body positions A82-40732
- BODY TEMPERATURE**
- Circadian changes in resting heart rate and body temperature, maximal oxygen consumption and perceived exertion A82-38268
- Thermoregulation and the menstrual cycle A82-40441
- Alterations in heat loss and heat production mechanisms in rat exposed to hypergravic fields A82-40718
- Core temperature and brainstem auditory evoked potentials as complimentary noninvasive measures of central neural function during exposure to hypergravic fields A82-40772
- Temperature and behavioral responses of squirrel monkeys to 2Gz acceleration A82-40774
- BODY VOLUME (BIOLOGY)**
- Short term gravity effects on volume homeostasis in man Assessment of transvascular fluid shifts after graded tilt A82-40760
- Output and efficiency of the heart in young athletes as a function of the type of athletic training A82-41497
- BODY WEIGHT**
- Dynamics of weight loss during prolonged spaceflight A82-40673
- Response of rat body composition to simultaneous exercise and centrifugation at 3.14g A82-40766
- BONE DEMINERALIZATION**
- Effect of space flight on bone strength A82-40680
- Evidence for arrested bone formation during spaceflight A82-40767
- BONE MARROW**
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-38169
- Separation of bone marrow cells in mice by free-flow electrophoresis A82-38536
- The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice A82-38556
- The circadian rhythm of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles A82-40462
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-40501
- BONE MINERAL CONTENT**
- Bone growth and composition in weanling and mature rats exposed to chronic centrifugation A82-40669
- Otoconial complexes as ion reservoirs in endolymph A82-40674
- BONES**
- The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones A82-38563

- Changes in mineralized tissues in the case of calcitonin and somatotrophic hormone injections under hypokinesia A82-40503
- Altered bone turnover during spaceflight A82-40679
- Bone resorption and calcium absorption in rats during spaceflight A82-40704
- Bone growth in the rat mandible during space flight A82-40705
- Adaptation of the rat skeleton to weightlessness and its physiological mechanisms - Results of animal experiments aboard the Cosmos-1129 biosatellite A82-40753
- Suppression of osteoblast differentiation during weightlessness A82-40756
- Application of laser therapy to patients with osteoarthritis deformans A82-41475
- BRADYCARDIA**
- The effect of repeated episodes of emotional stress on heart activity and the content of monoamines in the heart A82-38163
- Alterations in heart work rhythm during hyperactivation of the anterior amygdaline nucleus A82-38545
- BRAIN**
- The protective role of the forebrain with respect to pathological cardiac reflexes A82-38543
- Alterations in heart work rhythm during hyperactivation of the anterior amygdaline nucleus A82-38545
- The thermal pulsation method in the study of several physiological mechanisms of the brain stem A82-38559
- The content of cAMP and cGMP in brain tissues during adaptation to ischemia A82-40310
- A factor of resistance to emotional stress in the brain of rats A82-40452
- The anti-stress role of the gamma-aminobutyric acid system of the brain A82-40468
- Higher integrative systems of the brain --- Russian book A82-40642
- Neurochemical mechanisms of learning and memory --- Russian book A82-40646
- Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat A82-40699
- Chronic acceleration and brain density A82-40769
- The incorporation of P-32 into various sections of the brain upon exposure to intermittent noise of low intensity A82-41467
- Biochemical aspects of the mechanism by which cholinolytics affect the brain A82-41468
- Nitrogen compound levels in tissues of rat cerebral hemispheres and cerebellum after flight aboard Cosmos-1129 biosatellite N82-28967
- BRAIN CIRCULATION**
- The influence of the speed of blood flow in the carotid artery on the hematocrit of the blood being delivered to the brain A82-38550
- Diagnosis and organization of the therapy of patients with disorders of blood circulation in the brain A82-38554
- Prostaglandins and regulation of cerebral circulation under conditions of the altered gaseous composition of the blood A82-38561
- State of adaptation in patients with hypertension A82-40476
- Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system A82-40656
- The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats A82-40713
- Effects of prolonged bedrest in antiorthostatic position on rCBF measured by <sup>133</sup>Xe inhalation technique - Effects of clonidine --- regional Cerebral Blood Flow A82-40743
- Involuntary and voluntary mechanisms for preventing cerebral ischemia due to positive /Gz/ acceleration A82-40747
- Cardiac and cerebral vascular adaptation to gravitational stresses in man A82-40765
- Regulation of cerebral circulation in erect position N82-28957
- BRAIN DAMAGE**
- Intrahemispherical relations of EEG slow-wave components in patients with local brain lesions A82-40472
- Some of biochemical parameters in rat brain during +Gz acceleration A82-40717
- Dynamics of the brain electric activity in patients with cerebral insults under the effect of muscle stimulation with sinusoidal modulated currents A82-41477
- BRAIN STEM**
- Core temperature and brainstem auditory evoked potentials as complementary noninvasive measures of central neural function during exposure to hypergravic fields A82-40772
- BREATHING APPARATUS**
- A respirator for training in conditions of changeable respiratory mixture A82-40485
- BREEDING (REPRODUCTION)**
- Cultivation of insects as new branch of entomology - industrial entomology N82-28980
- BURNS (INJURIES)**
- Ultrasonic determination of thermodynamic threshold parameters for irreversible cutaneous burns A82-41122
- C**
- CALCIUM**
- Proof of the existence of Ca<sup>2+</sup>/-induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles A82-38599
- CALCIUM ISOTOPES**
- Otoconial complexes as ion reservoirs in endolymph A82-40674
- CALCIUM METABOLISM**
- Changes in electrically neutral Ca<sup>2+</sup>/-H<sup>+</sup>/ exchange in rat liver mitochondria following gamma irradiation A82-38151
- Two phases of the inotropic effect of adrenaline - The calcium dependence A82-38549
- The regulation of calcium exchange in the cells of different regions of the warm-blooded animal heart A82-40313
- Altered bone turnover during spaceflight A82-40679
- Effect of space flight on bone strength A82-40680
- Effect of immobilization on the ATPase activities and Ca-uptake of sarcoplasmic reticulum in different types of muscles A82-40708
- Osteoporosis in unsupported extremities N82-28970
- CALORIC REQUIREMENTS**
- Energy requirements of workers at an oil field in western Siberia A82-40481

## CALORIC STIMULI

### CALORIC STIMULI

- Nystagmometry of optovestibular interaction  
N82-28962
- Effect of caloric stimulation of vestibular system  
on hearing  
N82-28963

### CALORIMETERS

- Microcalorimetry in biomedical investigations  
A82-41471

### CANCER

- Electrical stimulation of the urinary bladder  
following radical surgery for cancer of the rectum  
A82-41479

### CARBOHYDRATE METABOLISM

- Studies of specific hepatic enzymes involved in  
the conversion of carbohydrates to lipids in  
rats exposed to prolonged spaceflight aboard  
Cosmos 1129  
A82-40698
- Metabolic distinctions related to intake of  
low-calorie 'survival' rations consisting only  
of readily assimilated carbohydrates  
N82-28953
- Effect of high ambient temperature on carbohydrate  
metabolism in rat liver and skeletal muscles  
N82-28975

### CARBON DIOXIDE

- Prostaglandins and regulation of cerebral  
circulation under conditions of the altered  
gaseous composition of the blood  
A82-38561

### CARBON DIOXIDE LASERS

- Sword and scalpel --- laser surgery  
A82-38564

### CARBON ISOTOPES

- Conditions leading to kinetic and thermodynamic  
isotopic effects in a cell  
A82-38601

### CARBON MONOXIDE POISONING

- The combined effect of carbon monoxide and  
total-body vibration on the organism  
A82-40475

### CARDIAC VENTRICLES

- Two phases of the inotropic effect of adrenaline -  
The calcium dependence  
A82-38549
- A study of the mechanism governing the different  
types of behavior exhibited by the spiral  
excitation wave period in auricle and ventricle  
A82-38597
- Echocardiographic characterization of heart  
hypertension  
A82-40307
- The effect of inotropic factors on the  
postexercise characteristics of the heart  
A82-40451
- The effects of +G2 acceleration stress on right  
ventricular pressures in conscious miniature  
swine.  
A82-40676
- Effect of warm-up on left ventricular response to  
sudden strenuous exercise  
A82-41212
- The significance of postextrasystolic potentiation  
in the preoperative assessment of the reversal  
of left-ventricle asynergy in patients with  
ischemic heart disease  
A82-41483
- An evaluation of the informativeness of EKG  
parameters in diagnosing a myocardial infarction  
of the back wall of the left ventricle  
A82-41493
- A comparison of echo- and kinetocardiographic  
indicators of the myocardial contractility of  
the left ventricle in patients suffering from  
various forms of ischemic heart disease  
A82-41496
- Dynamics of left ventricular systolic phase  
structure during long-term (140-185 days)  
spaceflights  
N82-28954

### CARDIOGRAPHY

- A modification of Souns' method of selective  
coronarography  
A82-41485

## SUBJECT INDEX

- A comparison of echo- and kinetocardiographic  
indicators of the myocardial contractility of  
the left ventricle in patients suffering from  
various forms of ischemic heart disease  
A82-41496

### CARDIOLOGY

- On the observability of electrical cardiac sources  
--- Thesis  
A82-41450

### CARDIOVASCULAR SYSTEM

- The characteristics of hemodynamic shifts under  
physical stress at mountain elevations  
A82-38166
- The detection of premorbid states and  
cardiovascular diseases during medical  
examinations of seamen  
A82-38553
- Investigation of the cardiovascular system during  
prolonged space flights on board the Salyut  
space stations  
A82-39429
- An automated system for the collection and  
processing of cardiovascular information from  
athletes  
A82-40484
- Methodological aspects of future cardiovascular  
research in space  
A82-40652
- Cardiovascular responses to isometric exercise  
during simulated zero gravity  
A82-40662
- Cardiovascular responses of the chronically  
instrumented monkey during simulated space flight  
A82-40670
- Aspects of cardiovascular adaptation to  
gravitational stresses  
A82-40687
- Body composition of rats flown aboard Cosmos-1129  
A82-40695
- Autonomic reactions in labyrinthectomized rabbits  
during centrifuge acceleration  
A82-40720
- Effects of lower body negative pressure on the  
reliability of cardiovascular system using X-ray  
kymograms  
A82-40728
- Orthostatic tolerance and exercise response before  
and after 7 days simulated weightlessness  
A82-40731
- Analysis of transient cardiovascular response to  
orthostatic stress using noninvasive methods  
A82-40740
- Effects of prolonged bedrest in antiorthostatic  
position on rCBF measured by 133Xe inhalation  
technique - Effects of clonidine --- regional  
Cerebral Blood Flow  
A82-40743
- Cardiovascular effects of Clonidine during 20  
hours head down tilt /-5 deg/  
A82-40764
- Cardiac and cerebral vascular adaptation to  
gravitational stresses in man  
A82-40765
- Effect of warm-up on left ventricular response to  
sudden strenuous exercise  
A82-41212
- The effect of the natural and climatic conditions  
of the Far North on the human cardiovascular  
system  
A82-41466
- The effect of ultrasound and phonophoresis of  
ganglioblockers on the cardiovascular system in  
patients with cervical osteochondrosis  
A82-41476
- Sources of an artificial magnetic field for  
implantation /experimental study/  
A82-41480

### CAROTID SINUS BODY

- Effects of a weightlessness simulation on the  
velocity curves measured by Doppler sonography  
at the level of the carotid system  
A82-40656

### CAROTID SINUS REFLEX

- Changes in the hemodynamics and efferent activity  
in the renal nerve with acute hypoxic hypoxia  
under the stabilization of perfusion pressure in  
carotid sinuses  
A82-38161

- Baroreflex regulation of hemodynamics under orthostatic effects /an investigation with a mathematical model/ A82-38162
- CATABOLISM**
- Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles A82-40712
- CATALYTIC ACTIVITY**
- Reactions of O-18 exchange in the myosin systems of skeletal, cardiac, and smooth muscles A82-38614
- CATECHOLAMINE**
- Catecholamines and enzymes of their metabolism in rat myocardium after flight aboard the Cosmos-936 biosatellite N82-28966
- CATEGORIES**
- Task categorization and the limits of human performance in extreme heat A82-40439
- CATHETERIZATION**
- A modification of Soums' method of selective coronarography A82-41485
- CATIONS**
- Specificity of action of monovalent cations on the ATPase activity of myosin HMM-S-1 A82-38594
- The effect of monovalent cations on the ATPase activity and superprecipitation of actomyosin A82-38615
- CELL DIVISION**
- Diurnal changes in the duration of the S and G2 phases of the mitotic cycle in mononuclear and binuclear hepatocytes of normal and thyroxine-treated rats A82-40459
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-40501
- Morphogenesis of a higher plant from cultured cells and embryos in space A82-40666
- Suppression of osteoblast differentiation during weightlessness A82-40756
- Myosatelloocytes and cambial properties of skeletal and muscular tissue A82-41469
- CELLS (BIOLOGY)**
- Optimization of the conditions of modified cell irradiation A82-38154
- Radiation damage and recovery of mouse T-cells. IV - Elimination of radiation-induced migration abnormalities in T-lymphocytes A82-38156
- Effects of cAMP accumulation activators on certain stages of genome expression in cells upon acute radiation damage to the organism. III Comparative study of the properties of RNA synthesized in a system of isolated liver and spleen cell nuclei from irradiated rats and animals having been treated with serotonin prior to irradiation A82-38157
- The dynamics of quantitative changes of RNA in rat cerebellum Purkinje cells in different functional states A82-38538
- The concentration of adenylyl nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress A82-38560
- Temperature characteristics of the ouabain-insensitive sodium flux in frog muscles A82-38600
- Conditions leading to kinetic and thermodynamic isotopic effects in a cell A82-38601
- F-actin is a helix with a random variable twist A82-38694
- The regulation of calcium exchange in the cells of different regions of the warm-blooded animal heart A82-40313
- The toxic properties of rabbit and dog sera under controlled hyperthermia A82-40458
- Changes of intracellular rest potential and the length of isolated muscle under different loads A82-40480
- Some of biochemical parameters in rat brain during +Gz acceleration A82-40717
- Changes of periodic protoplasmic movements on the fast clinostat A82-40725
- Root cell gravireaction - Hormone interaction A82-40745
- Cellular aspects of gravitational biology A82-40754
- The intracellular responses of frog eggs to novel orientations to gravity A82-40758
- Gravity sensing system formation in tadpoles /Rana temporaria/ developed in weightlessness simulation A82-40759
- Response of cultured cells to hyper- and hypogravity A82-40773
- A hygienic evaluation of the biological effects of nonionizing microwave radiation A82-41464
- CENTER OF GRAVITY**
- Simulation of the motion of the center of mass of an occupant under ejection accelerations [AD-A113806] N82-28989
- CENTIMETER WAVES**
- A hygienic evaluation of the biological effects of nonionizing microwave radiation A82-41464
- CENTRAL NERVOUS SYSTEM**
- A method of evaluating the functional state of the central nervous system of a person performing work A82-38579
- Otoneurological symptoms and syndromes --- Russian book A82-39286
- Central nervous dysfunctions after near-miss accidents in diving A82-40443
- The correlations of the central nervous system and thyroid functions in conditions of chronic emotional stress A82-40453
- Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129 A82-40737
- CENTRIFUGING STRESS**
- Study of high-g effects in animals A82-40651
- Bone growth and composition in weanling and mature rats exposed to chronic centrifugation A82-40669
- Centrifuge high-g effects on temperature regulation in unanesthetized rats A82-40671
- Artificial gravity in space flight A82-40691
- Stress in space flight - Metabolic aspects A82-40696
- Gravitational adaptation of animals A82-40716
- Some of biochemical parameters in rat brain during +Gz acceleration A82-40717
- Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration A82-40720
- Effect of sustained Gz acceleration on lung fluid balance - An ultrastructural study A82-40761
- Response of rat body composition to simultaneous exercise and centrifugation at 3.14g A82-40766
- Accidents in centrifuges and experiments (ejection seat training towers, sleds) N82-29881
- CEREBELLUM**
- The dynamics of quantitative changes of RNA in rat cerebellum Purkinje cells in different functional states A82-38538



## CEREBRAL CORTEX

## SUBJECT INDEX

- Spatial organization of the vestibular influences on the cerebellar fastigial neurons of cats  
A82-40312
- Nitrogen compound levels in tissues of rat cerebral hemispheres and cerebellum after flight aboard Cosmos-1129 biosatellite  
N82-28967
- CEREBRAL CORTEX**
- Local cerebral blood flow dynamics during experimental ischemia  
A82-38544
- The cholinergic nature of hypothalamo-cortical excitatory influence  
A82-38551
- Ultrastructural changes in the brains of rats subjected to acute emotional stress  
A82-38558
- Prostaglandins and regulation of cerebral circulation under conditions of the altered gaseous composition of the blood  
A82-38561
- Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating  
A82-38795
- The cortical regulation of human motion --- Russian book  
A82-39283
- Neurons in cat visual cortex tuned to the direction of motion in depth - Effect of positional disparity  
A82-39434
- Participation of the prefrontal cortex in delayed spatial choice and differentiation of time intervals in rhesus monkeys  
A82-40470
- Afferent associative and commissural projections of the cortical vestibular zone VI of cats  
A82-40495
- Age changes in the cerebral cortex of humans and cats /A comparative electron-microscopical investigation/  
A82-40496
- CEREBRAL VASCULAR ACCIDENTS**
- State of adaptation in patients with hypertension  
A82-40476
- CEREBRUM**
- The role of central gray matter in the activation of antipain systems of the rat's brain under stress  
A82-38547
- The concentration of adenyl nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress  
A82-38560
- CHEMICAL EVOLUTION**
- Clay and the origin of life  
A82-38115
- Formation of cyanate and carbamyl phosphate by electric discharges of model primitive gas  
A82-38116
- Uracil synthesis via HCN oligomerization --- chemical evolution of biomolecules in primitive earth  
A82-38117
- Polynucleotide replication coupled to protein synthesis A possible mechanism for the origin of life  
A82-38119
- Ambiguity and the evolution of the genetic code  
A82-38120
- Chemical evolution and the origin of life - Bibliography Supplement 1980  
A82-38122
- Ligation of oligonucleotides by pyrimidine dimers - A missing 'link' in the origin of life  
A82-39423
- Chemical evolution. XI - Clay-mediated oxidation of diaminomaleonitrile  
A82-41196
- The radiolysis of aqueous propionitrile - Compounds of interest to chemical evolution studies  
A82-41197
- A model for the origin of life  
A82-41198
- Acceleration of HCN oligomerization by formaldehyde and related compounds - Implications for prebiotic syntheses  
A82-41199
- Formation of the thioester, N-acetyl, S-lactoylcysteine, by reaction of N-acetylcysteine with pyruvaldehyde in aqueous solution --- in prebiotic evolution  
A82-41200
- CHEMICAL REACTIONS**
- Clay and the origin of life  
A82-38115
- Mechanical chemical and bio-hazards --- space-probe related planet and earth contaminations  
A82-39159
- Formation of the thioester, N-acetyl, S-lactoylcysteine, by reaction of N-acetylcysteine with pyruvaldehyde in aqueous solution --- in prebiotic evolution  
A82-41200
- CHEMORECEPTORS**
- Biochemical aspects of the mechanism by which cholinolytics affect the brain  
A82-41468
- CHEMOTHERAPY**
- An attempt at the classification of 'patient pharmacokinetic capacities'  
A82-38562
- CHLOROPHYLLS**
- Orientation and energy-transfer studies on chlorophyll in the photosynthetic membrane [D82-010180]  
N82-29852
- CHOLESTEROL**
- A measurement of the size distribution of lipoproteins in the plasma of human blood  
A82-38603
- CHOLINE**
- Biochemical aspects of the mechanism by which cholinolytics affect the brain  
A82-41468
- CHOLINERGICS**
- Early reaction of the hemopoietic organs depending on the condition of the peripheral M-cholinergic systems  
A82-38168
- The cholinergic nature of hypothalamo-cortical excitatory influence  
A82-38551
- The effect of hypokinesia on the resistance of the heart to hypoxia  
A82-40502
- CHROMOSOMES**
- The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice  
A82-38556
- The circadian rhythm of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles  
A82-40462
- CHRONIC CONDITIONS**
- Evaluation of vestibular function in flight personnel with chronic diseases during stable remission  
A82-38179
- Bone growth and composition in weanling and mature rats exposed to chronic centrifugation  
A82-40669
- Embryonic development during chronic acceleration  
A82-40755
- Chronic acceleration and brain density  
A82-40769
- The ultrastructure of the myocardium in the restorative period following aorto-coronary shunting in patients with chronic ischemic heart disease  
A82-41484
- CIRCADIAN RHYTHMS**
- Some characteristics of the diurnal rhythm of physiological functions of sailors in the tropics  
A82-38180
- Circadian changes in resting heart rate and body temperature, maximal oxygen consumption and perceived exertion  
A82-38268
- Rotating shift work schedules that disrupt sleep are improved by applying circadian principles  
A82-38325

- Diurnal changes in the duration of the S and G2 phases of the mitotic cycle in mononuclear and binuclear hepatocytes of normal and thyroxine-treated rats  
A82-40459
- The circadian rhythm of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles  
A82-40462
- Influences of horizontal hypokinesia on performance and circadian physiological rhythms in female humans  
A82-40682
- Biorhythms of rats during and after space flight  
A82-40692
- Rhythms of electrolytes and hydroxyproline excretion in urine of rats after three weeks of weightlessness - Biosatellite Cosmos-1129  
A82-40693
- Diurnal dynamics of the indicators of the capacity for physical work and of physiological functions  
A82-41460
- USSR report. Space biology and aerospace medicine, volume 16, no. 3, May - June 1982 [JPRS-81197]  
A82-28949
- Sleep, circadian cycles of physiological functions and parameters of human work capacity on first day after changing from altered to usual sleep-waking cycle  
A82-28951
- Synchronization of cardiovascular accidents with physical clocks  
A82-28956
- CIRCULATORY SYSTEM**  
A study of temporary absences from work arising from disorders of the circulatory system  
A82-38555
- Relevance of aldosterone on circulatory, renal and blood reactions during simulated weightlessness and on aerobic metabolic rate  
A82-40736
- CIVIL AVIATION**  
Physiological stresses linked to flight on airliners  
A82-38842
- Medical emergencies on board an airliner - Procedures when a doctor is on board  
A82-38844
- Medical emergencies on board airliners - Procedures in the absence of a doctor  
A82-38845
- Medical emergencies on board airliners - Ground management  
A82-38846
- CLAYS**  
Clay and the origin of life  
A82-38115
- Chemical evolution. XL - Clay-mediated oxidation of diaminomaleonitrile  
A82-41196
- CLINICAL MEDICINE**  
The potential of radionuclide diagnosis of acute myocardial infarction  
A82-41458
- Optimization of medicinal electrophoresis --- enhancement of cutaneous penetration  
A82-41472
- Present-day magnetic-field sources, used in medical treatment  
A82-41481
- The significance of postextrasystolic potentiation in the preoperative assessment of the reversal of left-ventricle asynergy in patients with ischemic heart disease  
A82-41483
- A modification of Souns' method of selective coronarography  
A82-41485
- The achievements of investigations carried out in the years 1976-1980 on the problem of insufficient blood circulation and heart rhythm disturbances  
A82-41501
- Clinical examination of spinal injuries  
A82-29882
- CLOSED ECOLOGICAL SYSTEMS**  
Evaluation of engineering foods for closed Ecological Life Support System (CELSS) [NASA-CR-167626]  
A82-29003
- Nutrition and food technology for a Controlled Ecological Life Support System (CELSS) [NASA-CR-167392]  
A82-29004
- Evaluation of engineering foods for Controlled Ecological Life Support Systems (CELSS) [NASA-CR-166359]  
A82-29006
- An approach to the preliminary evaluation of Closed Ecological Life Support System (CELSS) scenarios and control strategies [NASA-CR-166368]  
A82-29897
- CLOTTING**  
Features of microcirculatory hemostasis and of the clotting and fibrinolytic properties of blood and the activity of the antioxidant system in people of various ABO blood groups  
A82-38164
- COCHLEA**  
Pathomorphological investigation of the mechanism of cochlear damage caused by noise  
A82-39241
- COCKPITS**  
Flight crewmember workload evaluation [AD-A114167]  
A82-29012
- COGNITIVE PSYCHOLOGY**  
Mode of mutual influence of stimulation-characteristics in the visual processing system --- German thesis  
A82-41445
- COLD ACCLIMATIZATION**  
The physiological mechanisms of the arousal response in animals under conditions of hypobiosis  
A82-40311
- Trace reactions of the frog tissue metabolism on changes of ambient temperature in the frog Rana ridibunda Pall  
A82-40316
- The role of nutrition in the changes of energy metabolism during stress  
A82-40482
- Leucine and urea metabolism in acute human cold exposure  
A82-41211
- The effect of the natural and climatic conditions of the Far North on the human cardiovascular system  
A82-41466
- COLD WEATHER**  
Effect of physical training in cool and hot environments on +Gz acceleration tolerance in women  
A82-40664
- COLLAGENS**  
The temperature dependence of the H-1 NMR spectrum of hydrated collagen  
A82-38611
- Condition of rats connective tissue during long-term hypokinesia and in recovery period  
A82-28969
- COLOR VISION**  
Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating  
A82-38795
- Color vision in the peripheral retina under photopic conditions  
A82-38798
- Field sensitivity of the 'red' mechanism derived from primate local electroretinogram  
A82-39431
- Effect of chromatic adaptation on the achromatic locus - The role of contrast, luminance and background color  
A82-39433
- Discrimination and detection thresholds - The effect of observer criterion on the spatial properties of chromatic and achromatic mechanisms  
A82-39438
- Detection/discrimination in the long-wavelength pathways --- human color vision tests  
A82-39439
- COMPETITION**  
Adapting a scale for measuring competition anxiety  
A82-40450
- Certain psychological and tactical aspects of athlete activities during competitions  
A82-41506

## COMPUTER ASSISTED INSTRUCTION

## SUBJECT INDEX

## COMPUTER ASSISTED INSTRUCTION

- Potential applications of computer-assisted instruction to P-3 aircrew training  
[AD-A113491] N82-29893
- Instructor's role in individualized training: A survey of two computer managed courses  
[AD-A114917] N82-29894
- COMPUTERIZED SIMULATION**  
Modeling and simulation in the study of certain biological systems  
A82-39570
- Computer simulations of postural change, water immersion and bedrest - An integrative approach for understanding the spaceflight response  
A82-40659
- Simulation of the motion of the center of mass of an occupant under ejection accelerations  
[AD-A113806] N82-28989
- CONCENTRATION (COMPOSITION)**  
Nitrogen compound levels in tissues of rat cerebral hemispheres and cerebellum after flight aboard Cosmos-1129 biosatellite  
N82-28967
- CONDITIONED REFLEXES**  
Dynamics of a stabilized motor defensive conditioned reflex for different levels of motivation in irradiated rats  
A82-40464
- Participation of the prefrontal cortex in delayed spatial choice and differentiation of time intervals in rhesus monkeys  
A82-40470
- CONFERENCES**  
Proceedings of a Meeting of the IUPS Commission on Gravitational Physiology --- Book  
A82-40649
- International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980, Proceedings  
A82-40686
- International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, September 29-October 2, 1981, Proceedings  
A82-40734
- The organizing of conferences  
[PB82-142696] N82-28948
- CONNECTIVE TISSUE**  
Condition of rats connective tissue during long-term hypokinesia and in recovery period  
N82-28969
- CONSERVATION**  
Selecting optimal conditions for heart conservation in weak aldehyde solutions by using mathematical methods of experimental design  
A82-38534
- CONTAMINANTS**  
The consequences of hydrazine exposition and its treatment  
[MBL-1981-2] N82-28996
- CONTAMINATION**  
Mechanical chemical and bio-hazards --- space-probe related planet and earth contaminations  
A82-39159
- CONTROL**  
A design methodology for nonlinear systems containing parameter uncertainty: Application to nonlinear controller design  
[NASA-CR-166358] N82-29005
- CORIOVIS EFFECT**  
Vestibular screening of cosmonauts  
A82-38853
- CORNEA**  
Mitotic activity and volume of epithelial cell nuclei of rat cornea following spaceflights in biosatellites  
N82-28965
- CORONARY CIRCULATION**  
Diagnostics of disturbances of heart rhythm and conductance and their professional evaluation in flight personnel  
A82-40309
- The rate of coronary perfusion as a factor determining the extent to which the contractile function of the heart is decreased in energy formation disorders  
A82-41489

The role of the energy transport system in changes of the contractile function of the heart in the case of the measured limitation of coronary blood flow  
A82-41499

**CORROSION**

OTEC-1 power system test program: Biofouling and corrosion monitoring on OTEC-1  
[DE82-007035] N82-29851

**CORTI ORGAN**

Alterations of histochemical organization in the organ of Corti under the influence of chronic noise  
A82-39242

**CORTICOSTEROIDS**

The rate at which exogenous hydrocortisone is eliminated from peripheral blood flow in patients suffering from an acute myocardial infarction  
A82-41498

**CORTISONE**

The gradualness of the reaction of the pituitary-adrenocortical system to activating and inhibiting signals  
A82-40315

**COSMIC RAYS**

Medical-biological investigations under space conditions: Present and future significance  
N82-30275

**COSMONAUTS**

Orthostatic tests during cosmonaut selection  
A82-38854

Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations  
A82-39429

As if in weightlessness --- simulation through hypnosis  
A82-40474

Space gastroenterology --- Russian book  
A82-40643

Mechanisms of the effects of weightlessness on the motor system of man  
A82-40752

**COSMOS SATELLITES**

Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites  
A82-40688

Results of morphological investigations aboard biosatellites Cosmos  
A82-40697

**COSMOS 936 SATELLITE**

Ultrastructural qualitative and quantitative evaluation of cytoplasmatic structures of heart muscle of rats living aboard biosputnik Kosmos 936  
A82-40694

**COSMOS 1129 SATELLITE**

Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment  
A82-40701

**CRASH INJURIES**

Spinal stresses in flight  
N82-29873

Theories of the pathogenesis of fractures of the spine  
N82-29874

Aetiology and pathogenesis --- traumatic lesions of the spine  
N82-29875

Helicopter accidents  
N82-29876

Radiology of spinal trauma in aviation medicine  
N82-29883

Analytical study of traumatic lesions of C3-C7  
N82-29884

Radiological study of fractures of C1 and C2  
N82-29885

Sequelae of vertebral fractures and trauma  
N82-29886

Medico-legal aspect of spinal disorders in aviation medicine  
N82-29892

**CREATINE**

The concentration of adenylyl nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress  
A82-38560

**CROP GROWTH**

- Interaction of gravitic and mechanical stimuli in tropic and nastic responses in beans A82-40665
- Morphogenesis of a higher plant from cultured cells and embryos in space A82-40666
- Gravity perception and asymmetric growth in plants - A model derived from the grass pulvinus A82-40775

**CULTIVATION**

- USSR report. Life sciences biomedical and behavioral sciences, no. 16 [JPBS-80789] N82-28977
- Cultivation of insects as new branch of entomology - industrial entomology N82-28980

**CULTURE TECHNIQUES**

- Occult bacterial persistence and resistance to colonization after antibiotic therapy A82-40460
- Morphogenesis of a higher plant from cultured cells and embryos in space A82-40666

**CURVES (GEOMETRY)**

- Segmentation and analysis of stereophotometric body surface data [AD-A114916] N82-29868

**CYANATES**

- Formation of cyanate and carbamyl phosphate by electric discharges of model primitive gas A82-38116

**CYANIDES**

- Chemical evolution. XL - Clay-mediated oxidation of diaminomaleonitrile A82-41196

**CYANO COMPOUNDS**

- Acceleration of HCN oligomerization by formaldehyde and related compounds - Implications for prebiotic syntheses A82-41199

**CYCLIC COMPOUNDS**

- Ion currents through a neuron membrane during the injection of cyclic nucleotides A82-38588

**CYTOGENESIS**

- Cytogenetic effect of 5-fluoro-2desoxy uridine in the G2 phase on intact and X-irradiated crepis capillaris L cells A82-40461
- The circadian rhythm of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles A82-40462
- Cytoarchitectonics of the epidermis and the epidermal proliferative units /EPU/ A82-40491
- Suppression of osteoblast differentiation during weightlessness A82-40756
- Methodological aspects of testing erythrocyte balance by counting incubated reticulocytes N82-28972
- Cytogenetic analysis of peripheral blood lymphocytes of individuals exposed to low doses of ionizing radiation N82-29856

**CYTOLOGY**

- Optimization of the conditions of modified cell irradiation A82-38154
- Radiation damage and recovery of mouse T-cells. IV - Elimination of radiation-induced migration abnormalities in T-lymphocytes A82-38156
- Effects of cAMP accumulation activators on certain stages of genome expression in cells upon acute radiation damage to the organism. III Comparative study of the properties of RNA synthesized in a system of isolated liver and spleen cell nuclei from irradiated rats and animals having been treated with serotonin prior to irradiation A82-38157
- RNA-content distribution of cells from the normal and atherosclerotic human aorta A82-38535

Conditions leading to kinetic and thermodynamic isotopic effects in a cell

- A82-38601
- Light curves for photosynthesis under intermittent illumination A82-38608
- Approaches to the study of the hypothalamus-pituitary gland relationship A82-39569
- Cellular aspects of gravitational biology A82-40754
- The structure and function of macrophages A82-41470

**CYTOPLASM**

- The dynamics of quantitative changes of RNA in rat cerebellum Purkinje cells in different functional states A82-38538
- Gravity sensing, polar transport and cytoplasmic streaming in plant cells A82-40667
- Ultrastructural qualitative and quantitative evaluation of cytoplasmic structures of heart muscle of rats living aboard biosputnik Kosmos 936 A82-40694

**D****DARK ADAPTATION**

- Color vision in the peripheral retina under photopic conditions A82-38798

**DATA ACQUISITION**

- An automated system for the collection and processing of cardiovascular information from athletes A82-40484
- A functional video-based anthropometric measuring system [NASA-CR-167637] N82-29896

**DECISION MAKING**

- A test for the prediction of risk-taking attitude in operators A82-40449
- An overview of expert systems --- artificial intelligence [NASA-CR-169197] N82-29899

**DECOMPRESSION SICKNESS**

- Vibration and decompression gas bubbles A82-40729

**DEHYDRATION**

- ADH suppression under immersion combined with dehydration --- antidiuretic hormone secretion A82-40776

**DEHYDROGENATION**

- The effect of urea and heat on the activity of lactate dehydrogenase and glucose 6-phosphate dehydrogenase A82-38612

**DENSITY (MASS/VOLUME)**

- Chronic acceleration and brain density A82-40769

**DENTISTRY**

- Acoustic tooth cleaner [NASA-CASE-LAR-12471-1] N82-29862

**DEOXYRIBONUCLEIC ACID**

- Changes in the relations of pyrimidine blocks in DNA of the hematopoietic system immediately following gamma irradiation of the animal A82-38152
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-38169
- Study of RNA synthesis rate and DNA content in the myocardium of new-born rats during adaptation to high-altitude hypoxia A82-38537
- Ligation of oligonucleotides by pyrimidine dimers - A missing 'link' in the origin of life A82-39423
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-40501

## DEPRESSANTS

- Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats  
A82-40723
- DEPRESSANTS**  
Vegetative reactions to the administration of atropine and propranolol in rats that exhibit different types of behavior  
A82-40463
- DESIGN ANALYSIS**  
Control of a direct-drive arm  
[AD-A114969]  
N82-29903
- DETECTION**  
Detection/discrimination in the long-wavelength pathways --- human color vision tests  
A82-39439
- DIAGNOSIS**  
Diagnosis and organization of the therapy of patients with disorders of blood circulation in the brain  
A82-38554  
Application of xylite for the detection of labyrinthine hydrops  
A82-39243  
Diagnostics of disturbances of heart rhythm and conductance and their professional evaluation in flight personnel  
A82-40309  
The use of hyperoxic mixtures for the diagnosis of latent disturbances in the external respiration system  
A82-40457  
The diagnostic value of phonocenterography in acute renal failure  
A82-40478  
The potential of radionuclide diagnosis of acute myocardial infarction  
A82-41458  
Functional properties of T-lymphocytes in patients with acute myocardial infarction  
A82-41459  
A modification of Souns' method of selective coronarography  
A82-41485  
An evaluation of the informativeness of EKG parameters in diagnosing a myocardial infarction of the back wall of the left ventricle  
A82-41493
- DIBASIC COMPOUNDS**  
A comparison between the protonophoric and separating functions of weak dibasic acids --- in mitochondrial respiration  
A82-38590
- DIENCEPHALON**  
Statistical analysis of neuronal impulse activity in the diencephalon during immobilization-produced emotional stress in rats  
A82-40467
- DIFFERENTIATION (BIOLOGY)**  
Cytoarchitectonics of the epidermis and the epidermal proliferative units /EPU/  
A82-40491  
Suppression of osteoblast differentiation during weightlessness  
A82-40756
- DIGESTIVE SYSTEM**  
The reaction of simulated and true weightlessness on digestive tract of rats  
A82-40733
- DIGITAL DATA**  
A functional video-based anthropometric measuring system  
[NASA-CR-167637]  
N82-29896
- DIMERIZATION**  
Ligation of oligonucleotides by pyrimidine dimers - A missing 'link' in the origin of life  
A82-39423
- DISEASES**  
Application of xylite for the detection of labyrinthine hydrops  
A82-39243  
Alterations in the labyrinth receptors after laser irradiation as detected by electron microscopy  
A82-39244  
The circadian rhythm of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles  
A82-40462

## SUBJECT INDEX

- DISPLACEMENT MEASUREMENT**  
Effects of reference lines on displacement thresholds at various durations of movement --- in human visual perception  
A82-38797
- DISPLAY DEVICES**  
Visual Technology Research Simulator (VTRS) human performance research: Phase 3  
[AD-A112475]  
N82-28988  
Unconventional visual displays for flight training  
[AD-A111392]  
N82-28999
- DISTRIBUTION (PROPERTY)**  
On the mathematical modelling of microbial age dynamic and some control aspects of microbial growth processes  
A82-38823
- DIVING (UNDERWATER)**  
Central nervous dysfunctions after near-miss accidents in diving  
A82-40443
- DOSIMETERS**  
Neutron radiation dosimetry in high altitude flight personnel  
A82-40444
- DRINKING**  
The effectiveness of perspiration in a hot environment  
A82-38178
- DROSOPHILA**  
Radiation-induced shortening of the life span of *D. melanogaster*. II - Sensitizing effects of 5-bromo-2-deoxyuridine  
A82-38155
- DRUGS**  
Experimental and clinical study of a new immunoregulatory preparation - thymalin  
A82-38177  
The influence of the GABA-receptor blocker bicuculline on the effects of fenibut and diazepam  
A82-38539  
The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones  
A82-38563  
Application of xylite for the detection of labyrinthine hydrops  
A82-39243  
Participation of the prefrontal cortex in delayed spatial choice and differentiation of time intervals in rhesus monkeys  
A82-40470  
In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys  
A82-41214  
The effect of diethylamine analog of ethmazine on the functional condition of myocardium /Clinical and experimental study/  
A82-41488  
The effect of leienkephalin and tyrosine on the lymphatic and blood microvessels  
A82-41490
- DRY HEAT**  
Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments  
A82-40440
- DYES**  
Acridine orange inhibition of the ATPase activity of myosin and its fragments  
A82-38613
- DYNAMIC CHARACTERISTICS**  
Dynamics of left ventricular systolic phase structure during long-term (140-185 days) spaceflights  
N82-28954
- DYNAMIC RESPONSE**  
Simulation of the motion of the center of mass of an occupant under ejection accelerations  
[AD-A113806]  
N82-28989
- DYSPNEA**  
Dyspnea - What is it  
A82-41461
- E**
- EAR**  
Preparation of labyrinthectomized animals for flight aboard Cosmos-936 biosatellite  
N82-28971

**EARTH (PLANET)**

Chemical evolution. XL - Clay-mediated oxidation  
of diaminomaleonitrile  
A82-41196

**ECHOCARDIOGRAPHY**

Echocardiographic characterization of heart  
hypertension  
A82-40307

The amplitude of the R wave and the contractile  
function of the left ventricle in patients with  
ischemic heart disease  
A82-41486

A comparison of echo- and kinetocardiographic  
indicators of the myocardial contractility of  
the left ventricle in patients suffering from  
various forms of ischemic heart disease  
A82-41496

**ECOLOGY**

A design methodology for nonlinear systems  
containing parameter uncertainty: Application  
to nonlinear controller design  
[NASA-CR-166358]  
N82-29005

**EDEMA**

Causes of high-altitude acute pulmonary edema  
A82-38167  
The cause of high-altitude acute pulmonary edema  
A82-40498

**EDUCATION**

Output and efficiency of the heart in young  
athletes as a function of the type of athletic  
training  
A82-41497

Instructor's role in individualized training: A  
survey of two computer managed courses  
[AD-A114917]  
N82-29894

**EFFECTIVENESS**

Efficacy of kavinton in prevention of motion  
sickness  
N82-28961

**EFFERENT NERVOUS SYSTEMS**

Changes in the hemodynamics and efferent activity  
in the renal nerve with acute hypoxic hypoxia  
under the stabilization of perfusion pressure in  
carotid sinuses  
A82-38161

The cortical regulation of human motion ---  
Russian book  
A82-39283

Mechanisms of the effects of weightlessness on the  
motor system of man  
A82-40752

**EGGS**

Clinostat exposure and symmetrization of frog eggs  
A82-40757

**EJECTION INJURIES**

Spinal stresses in flight  
N82-29873

Theories of the pathogenesis of fractures of the  
spine  
N82-29874

Ejection of pilots from combat aircraft  
N82-29877

**EJECTION SEATS**

Simulation of the motion of the center of mass of  
an occupant under ejection accelerations  
[AD-A113806]  
N82-28989

**EJECTION TRAINING**

Accidents in centrifuges and experiments (ejection  
seat training towers, sleds)  
N82-29881

**ELECTRIC DISCHARGES**

Formation of cyanate and carbamyl phosphate by  
electric discharges of model primitive gas  
A82-38116

**ELECTRIC STIMULI**

Alterations in heart work rhythm during  
hyperactivation of the anterior amygdaline nucleus  
A82-38545

The cholinergic nature of hypothalamo-cortical  
excitatory influence  
A82-38551

The gradualness of the reaction of the  
pituitary-adrenocortical system to activating  
and inhibiting signals  
A82-40315

The effect of the electrical stimulation of  
afferent pathways on neurons in septal slices  
A82-40469

Dynamics of the brain electric activity in  
patients with cerebral insults under the effect  
of muscle stimulation with sinusoidal modulated  
currents  
A82-41477

Electrical stimulation of the urinary bladder  
following radical surgery for cancer of the rectum  
A82-41479

**ELECTROANESTHESIA**

The use of electrovacuum therapy in certain  
diseases of the peripheral nervous system  
A82-41478

**ELECTROCARDIOGRAPHY**

On the observability of electrical cardiac sources  
--- Thesis  
A82-41450

An evaluation of the informativeness of EKG  
parameters in diagnosing a myocardial infarction  
of the back wall of the left ventricle  
A82-41493

**ELECTROCONDUCTIVITY**

The mechanism of the microwave effect on the  
conductivity of bilayer lipid membranes  
A82-38587

The conductivity of model protein-lipid  
membranes  
A82-38604

**ELECTRODES**

Microelectronic electrode probe for testing brain  
electrical activity  
N82-28982

**ELECTRODIALYSIS**

The utilization of macromolecules in blood  
purification systems  
[NRC/CNR-TT-2021]  
N82-29864

**ELECTROENCEPHALOGRAPHY**

A study of the mechanism governing the different  
types of behavior exhibited by the spiral  
excitation wave period in auricle and ventricle  
A82-38597

The cortical regulation of human motion ---  
Russian book  
A82-39283

Intrahemispherical relations of EEG slow-wave  
components in patients with local brain lesions  
A82-40472

Characteristics of night sleep disorders in the  
case of myocardial infarction according to  
polygraphic data  
A82-41491

**ELECTROLYTE METABOLISM**

Rhythms of electrolytes and hydroxyproline  
excretion in urine of rats after three weeks of  
weightlessness - Biosatellite Cosmos-1129  
A82-40693

Biochemical aspects of the mechanism by which  
cholinolytics affect the brain  
A82-41468

Role of hormonal compounds in regulation of  
electrolyte metabolism in the presence of  
emotional stress  
N82-28952

**ELECTROMAGNETIC ABSORPTION**

Absorption characteristics of prolate spheroidal  
models exposed to the near fields of  
electrically small apertures  
A82-38802

**ELECTROMAGNETIC FIELDS**

Hygienic evaluation of an 8-mm-wave  
electromagnetic field  
A82-41462

Effects of low-intensity electromagnetic fields on  
human and animal erythrocytes  
N82-28974

**ELECTROMETERS**

Electrometric investigation of human gustatory  
analyzer under normal conditions and in  
simulated weightlessness  
N82-29859

**ELECTROMYOGRAPHY**

The physiological mechanisms of the arousal  
response in animals under conditions of hypobiosis  
A82-40311

**ELECTRON MICROSCOPY**

Alterations in the labyrinth receptors after laser  
irradiation as detected by electron microscopy  
A82-39244

**ELECTRONYSTAGMOGRAPHY**

Nystagmometry of optovestibular interaction  
N82-28962



## ELECTROPHORESIS

## ELECTROPHORESIS

- Separation of bone marrow cells in mice by free-flow electrophoresis A82-38536
- Effect of immobilization on the nonhistone protein composition in different types of skeletal muscles A82-40711
- Optimization of medicinal electrophoresis --- enhancement of cutaneous penetration A82-41472
- The use of electrovacuum therapy in certain diseases of the peripheral nervous system A82-41478

## ELECTROPHYSIOLOGY

- The role of central gray matter in the activation of antipain systems of the rat's brain under stress A82-38547
- Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating A82-38795
- USSR report. Life sciences biomedical and behavioral sciences, no. 16 [JPBS-80789] N82-28977
- Microelectronic electrode probe for testing brain electrical activity N82-28982

## ELECTRORETINOGRAPHY

- Field sensitivity of the 'red' mechanism derived from primate local electroretinogram A82-39431

## ELECTROSTRICTION

- A possible explanation for the fluctuations in reflectivity exhibited by bilayer lipid membranes excited during electrostriction A82-38602

## EMBRYOS

- Embryonic development during chronic acceleration A82-40755

## EMERGENCIES

- The nature and rate of occurrence of medical emergencies on board Air France aircraft A82-38841
- Medical emergencies in flight - Pathogenic aspects A82-38843
- Medical emergencies on board airliners - Procedures in the absence of a doctor A82-38845

## EMERGENCY LIFE SUSTAINING SYSTEMS

- USSR report. Space biology and aerospace medicine, volume 16, no. 3, May - June 1982 [JPBS-81197] N82-28949
- Metabolic distinctions related to intake of low-calorie 'survival' rations consisting only of readily assimilated carbohydrates N82-28953

## EMOTIONAL FACTORS

- The effect of repeated episodes of emotional stress on heart activity and the content of monoamines in the heart A82-38163
- Ultrastructural changes in the brains of rats subjected to acute emotional stress A82-38558
- A factor of resistance to emotional stress in the brain of rats A82-40452
- The correlations of the central nervous system and thyroid functions in conditions of chronic emotional stress A82-40453
- Statistical analysis of neuronal impulse activity in the diencephalon during immobilization-produced emotional stress in rats A82-40467
- Functional condition of the heart mitochondria in the dynamics of emotional and pain stress A82-41500
- USSR report. Space biology and aerospace medicine, volume 16, no. 3, May - June 1982 [JPBS-81197] N82-28949
- Role of hormonal compounds in regulation of electrolyte metabolism in the presence of emotional stress N82-28952
- Slow waves of cardiac rhythm in healthy man under different conditions N82-28955

## SUBJECT INDEX

## ENDOCRINE SYSTEMS

- Delayed effects of the internal irradiation of endocrine system in female rats A82-38582
- Results of morphological investigations aboard biosatellites Cosmos A82-40697

## ENDOLYMPH

- Otoconial complexes as ion reservoirs in endolymph A82-40674

## ENDOTHELIUM

- The response of the venous walls in the extremities to a disturbed venous outflow A82-40493

## ENERGY TRANSFER

- The role of the energy transport system in changes of the contractile function of the heart in the case of the measured limitation of coronary blood flow A82-41499
- Orientation and energy-transfer studies on chlorophyll in the photosynthetic membrane [DB82-010180] N82-29852
- ENTOMOLOGY
- Cultivation of insects as new branch of entomology - industrial entomology N82-28980

## ENVIRONMENT EFFECTS

- Mechanical chemical and bio-hazards --- space-probe related planet and earth contaminations A82-39159

## ENVIRONMENT SIMULATORS

- Research opportunities and limitations of protracted hypogravity simulations for plant gravitational physiology A82-40653

## ENVIRONMENTAL ENGINEERING

- An industrial hygiene evaluation of aircraft refueling inside closed aircraft shelters at elevated ambient temperatures [AD-A114396] N82-28994

## ENVIRONMENTAL LABORATORIES

- Cardiovascular responses of the chronically instrumented monkey during simulated space flight A82-40670

## ENVIRONMENTAL MONITORING

- USSR report. Life sciences biomedical and behavioral sciences, no. 16 [JPBS-80789] N82-28977
- Microorganisms used to monitor environmental pollution N82-28978

## ENZYME ACTIVITY

- State of the lactate dehydrogenase reaction in the muscular tissue of irradiated animals A82-38158
- Enzymes that detoxify active forms of oxygen and lipoperoxide in experimental ischemia and myocardial infarction A82-38540
- Evidence of an immune mechanism of enzyme-hemostasis regulation A82-38552
- The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase A82-38591
- Specificity of action of monovalent cations on the ATPase activity of myosin HMM-S-1 A82-38594
- The effect of urea and heat on the activity of lactate dehydrogenase and glucose 6-phosphate dehydrogenase A82-38612
- The effect of monovalent cations on the ATPase activity and superprecipitation of actomyosin A82-38615
- The histochemistry of enzymes in specific skin glands of the European hedgehog /Erinaceus europaeus/ during hibernation A82-39792
- ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation A82-40479
- Changes in neurons of the spinal cord and spinal ganglia under hypokinesia /neuromorphological and histochemical investigation/ A82-40494

- Stress in space flight - Metabolic aspects  
A82-40696
- Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat  
A82-40699
- Na<sup>+</sup>/K<sup>+</sup> dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats  
A82-40707
- Effect of immobilization on the ATPase activities and Ca-uptake of sarcoplasmic reticulum in different types of muscles  
A82-40708
- Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles  
A82-40712
- Some of biochemical parameters in rat brain during +Gz acceleration  
A82-40717
- Protection from O<sub>2</sub> toxicity by preexposure to hypoxia - Lung antioxidant enzyme role  
A82-41217
- Catecholamines and enzymes of their metabolism in rat myocardium after flight aboard the Cosmos-936 biosatellite  
N82-28966
- ENZYMES**
- Evolution of major metabolic innovations in the Precambrian  
A82-38121
- Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of *Neurospora crassa*  
A82-38698
- Monograph on new direction of chemistry and biology of peptide and protein bioregulators reviewed  
N82-28979
- ENZYMIOLOGY**
- Histoenzymological changes in experimental animals exposed to variable noise  
A82-38577
- EPIDERMIS**
- Cytoarchitectonics of the epidermis and the epidermal proliferative units /EPU/  
A82-40491
- EPILEPSY**
- The influence of a constant magnetic field on the epileptogenic foci in the hippocampus of rabbits  
A82-40466
- EPINEPHRINE**
- Two phases of the inotropic effect of adrenaline - The calcium dependence  
A82-38549
- The effect of hyperactivation of the anterior amygdaloid nucleus on heart activity during states of altered reactivity  
A82-40454
- EPITHELIUM**
- Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions  
A82-38586
- Cytoarchitectonics of the epidermis and the epidermal proliferative units /EPU/  
A82-40491
- Gravity sensing system formation in tadpoles /*Rana temporaria*/ developed in weightlessness simulation  
A82-40759
- Mitotic activity and volume of epithelial cell nuclei of rat cornea following spaceflights in biosatellites  
N82-28965
- ERGOMETERS**
- The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension  
A82-40477
- The use of biochemical monitoring methods in the ergometry of patients with atherosclerosis  
A82-41494
- ERYTHROCYTES**
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis  
A82-38169
- A measurement of the size distribution of lipoproteins in the plasma of human blood  
A82-38603
- The incorporation of an erythrocyte membrane into planar bilayer lipid membranes  
A82-38606
- ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation  
A82-40479
- The effect of products erythrocyte destruction on immunological processes  
A82-40500
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis  
A82-40501
- Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218
- Methodological aspects of testing erythrocyte balance by counting incubated reticulocytes  
N82-28972
- Effects of low-intensity electromagnetic fields on human and animal erythrocytes  
N82-28974
- ESTERS**
- Formation of the thioester, N-acetyl, S-lactoylcysteine, by reaction of N-acetylcysteine with pyruvaldehyde in aqueous solution --- in prebiotic evolution  
A82-41200
- ETHYL ALCOHOL**
- Alcohol-induced physiological displacements and their effects on flight related functions [AD-A114919]  
N82-29867
- ETIOLOGY**
- The conditions attending muscular strain in work involving only a few types of movements  
A82-38569
- Aetiology and pathogenesis --- traumatic lesions of the spine  
N82-29875
- EUROPEAN SPACE AGENCY**
- Selection and training of European astronauts  
A82-39507
- EVAPORATIVE COOLING**
- Effect of heating rate on evaporative heat loss in the microwave-exposed mouse  
A82-41208
- EVAPORATORS**
- OTEC biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico [DE82-007037]  
N82-28947
- EVOKED RESPONSE (PSYCHOPHYSIOLOGY)**
- Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating  
A82-38795
- Gravity only dependent receptor field of the vestibular sensors its significance in orbital flight  
A82-40770
- EXAMINATION**
- Clinical examination of spinal injuries  
N82-29882
- EXCRETION**
- Rhythms of electrolytes and hydroxyproline excretion in urine of rats after three weeks of weightlessness - Biosatellite Cosmos-1129  
A82-40693
- Tritium oxide distribution and excretion kinetics in the exposure of animals to noise  
A82-41463
- EXERCISE PHYSIOLOGY**
- Circadian changes in resting heart rate and body temperature, maximal oxygen consumption and perceived exertion  
A82-38268
- The changes in the concentration of free amino acids in muscles during exercise  
A82-40314
- Effect of warm-up on left ventricular response to sudden strenuous exercise  
A82-41212
- Metabolic and cardiovascular adaptations in trained hypophysectomized rats  
A82-41215
- Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218

Acid-base, metabolic, and ventilatory responses to repeated bouts of exercise A82-41219

Output and efficiency of the heart in young athletes as a function of the type of athletic training A82-41497

Problems in the metrology of the training load of ski racers A82-41502

Optimizing conditions for athletic activity with an allowance made for neurodynamic peculiarities /using bicycle sports as a model/ A82-41503

Physiological studies of heat stress acclimation during a specific exercise regimen [AD-A111897] N82-28991

Hypo- and hyperglycemia in rats: Effects on the ability to work in the heat [AD-A111711] N82-29849

Determination of maximal aerobic power during upper body exercise [AD-A111712] N82-29866

**EXOBIOLOGY**

Mechanical chemical and bio-hazards --- space-probe related planet and earth contaminations A82-39159

Lockheed involvement in Shuttle life sciences flight experiments A82-39541

Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats A82-40723

Changes of periodic protoplasmic movements on the fast clinostat A82-40725

Biomedical research publications: 1980 - 1982 [NASA-CR-3587] N82-29848

Medical-biological investigations under space conditions: Present and future significance N82-30275

Twenty years of manned space flight from the viewpoint of space medicine N82-30276

**EXPERIMENTAL DESIGN**

Selecting optimal conditions for heart conservation in weak aldehyde solutions by using mathematical methods of experimental design A82-38534

**EXPLORATION**

USSR report. Life sciences biomedical and behavioral sciences, no. 16 [JPRS-80789] N82-28977

Orienting and exploratory behavior of gray rat in open field. Zoopsychological analysis N82-28981

**EXPOSURE**

Leucine and urea metabolism in acute human cold exposure A82-41211

Long-term and progressive changes in Rhesus spectral sensitivity after low-level coherent light (514nm exposure) --- effects of laser exposure on visual function [AD-A111639] N82-28946

An industrial hygiene evaluation of aircraft refueling inside closed aircraft shelters at elevated ambient temperatures [AD-A114396] N82-28994

What is ALARA [DE81-030814] N82-28995

The consequences of hydrazine exposition and its treatment [NBL-1981-2] N82-28996

**EXTRAVEHICULAR ACTIVITY**

Twenty years of manned space flight from the viewpoint of space medicine N82-30276

**EYE (ANATOMY)**

Model of the accommodative mechanism in the human eye A82-39432

**EYE MOVEMENTS**

Current problems concerning the vestibulo-ocular interaction A82-39416

Retinal location and visual localization during pursuit eye movement A82-39436

A procedure for the analysis of nystagmus and other eye movements [AD-A112603] N82-28987

**EYE PROTECTION**

Cold weather goggles. 2: Performance evaluation [AD-A114067] N82-29008

## F

**FACE (ANATOMY)**

Respiratory movements of the facial muscles and respiratory resistance A82-40456

**FEEDBACK CONTROL**

Control of a direct-drive arm [AD-A114969] N82-29903

**FEMALES**

Twenty years of manned space flight from the viewpoint of space medicine N82-30276

**FIBRINOGEN**

Features of microcirculatory hemostasis and of the clotting and fibrinolytic properties of blood and the activity of the antioxidant system in people of various ABO blood groups A82-38164

**FIGHTER AIRCRAFT**

The cervical column of pilots of combat aircraft N82-29888

**FILAMENTS**

F-actin is a helix with a random variable twist A82-38694

**FIRST AID**

Diagnosis and organization of the therapy of patients with disorders of blood circulation in the brain A82-38554

Medical emergencies on board an airliner - Procedures when a doctor is on board A82-38844

Medical emergencies on board airliners - Procedures in the absence of a doctor A82-38845

**FLIGHT CREWS**

Diagnostics of disturbances of heart rhythm and conductance and their professional evaluation in flight personnel A82-40309

Development of a methodology for assessing aircrew workloads [AD-A114364] N82-29010

Aircraft and crew scheduling during airlift operations [AD-A114114] N82-29011

**FLIGHT FITNESS**

Standards of physical condition for private pilots of aircraft and gliders A82-38847

Aging and visual function of military pilots - A review A82-40435

**FLIGHT SAFETY**

Human factor and flight safety A82-40885

**FLIGHT SIMULATORS**

Visual Technology Research Simulator (VTRS) human performance research: Phase 3 [AD-A112475] N82-28988

**FLIGHT STRESS (BIOLOGY)**

Physiological stresses linked to flight on airliners A82-38842

Medical emergencies in flight - Pathogenic aspects A82-38843

Aerobatics in light aircraft - Sensations and stresses experienced by the pilot A82-38848

Medico-physiological aspects of stunt-flying A82-38849

Physiological stresses in flying a sailplane A82-38850

In-flight incapacitation and pathology for the light aircraft stunt-flyer A82-38851

Body composition of rats flown aboard Cosmos-1129 A82-40695

- Reduction in renal artery blood flow impedance during upright tilt in man A82-40735
- Spinal stresses in flight N82-29873
- Fractures of the spine in flight N82-29880
- The spine and fitness for flight N82-29889
- FLIGHT TRAINING**
- Unconventional visual displays for flight training [AD-A111392] N82-28999
- Potential applications of computer-assisted instruction to P-3 aircrew training [AD-A113491] N82-29893
- FLOW DISTRIBUTION**
- The effect of G sub z acceleration on pulmonary perfusion in the miniature swine A82-40681
- FLOW RESISTANCE**
- Reduction in renal artery blood flow impedance during upright tilt in man A82-40735
- FLOW VELOCITY**
- The influence of the speed of blood flow in the carotid artery on the hematocrit of the blood being delivered to the brain A82-38550
- The speed of blood flow in athletes subjected to the combined action of a training regime and high-altitude climatic factors A82-41505
- FLUCTUATION THEORY**
- Attributing macroscopic fluctuations in aqueous solutions of proteins and other substances to the class of flicker noise A82-38592
- FLUID FLOW**
- Gravity sensing, polar transport and cytoplasmic streaming in plant cells A82-40667
- FLUORINE ORGANIC COMPOUNDS**
- Cytogenetic effect of 5-fluoro-2desoxy uridine in the G2 phase on intact and X-irradiated crepis capillaris L cells A82-40461
- FLYING PERSONNEL**
- Evaluation of vestibular function in flight personnel with chronic diseases during stable remission A82-38179
- Neutron radiation dosimetry in high altitude flight personnel A82-40444
- FOKKER-PLANCK EQUATION**
- Conformational dynamics of proteins and simplest molecular 'machines' A82-38610
- FOOD PROCESSING**
- Evaluation of engineering foods for closed Ecological Life Support System (CELSS) [NASA-CR-167626] N82-29003
- Evaluation of engineering foods for Controlled Ecological Life Support Systems (CELSS) [NASA-CR-166359] N82-29006
- FORMALDEHYDE**
- Acceleration of HCN oligomerization by formaldehyde and related compounds - Implications for prebiotic syntheses A82-41199
- FOULING**
- OTEC biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico [DE82-007037] N82-28947
- OTEC-1 power system test program: Biofouling and corrosion monitoring on OTEC-1 [DE82-007035] N82-29851
- FREE FALL**
- Ultra-high impact free-fall survival A82-40684
- Limits of human tolerance for impacts in free fall N82-29879
- FREEON**
- Superior heat-transfer fluids for solar heating and cooling applications. Results of acute oral toxicity determinations [DE82-003071] N82-29869
- FREQUENCY DISTRIBUTION**
- Attributing macroscopic fluctuations in aqueous solutions of proteins and other substances to the class of flicker noise A82-38592
- FROGS**
- Clinostat exposure and symmetrization of frog eggs A82-40757
- FUNGI**
- Mycelial fungi, isolated from the ice sheet of the central Antarctic A82-39428
- G**
- GALVANIC SKIN RESPONSE**
- Phase analysis of dynamics of galvanic skin responses in man N82-29861
- GANGLIA**
- The impulse activity of neurons in the nodose ganglion during acute hemodynamic and respiratory disorders A82-38546
- GARMENTS**
- Thermal garment [NASA-CASE-XMS-03694-1] N82-29002
- GAS COMPOSITION**
- Prostaglandins and regulation of cerebral circulation under conditions of the altered gaseous composition of the blood A82-38561
- The use of hyperoxic mixtures for the diagnosis of latent disturbances in the external respiration system A82-40457
- Domestic swine in physiological research. 3: Blood gas and acid-base values of arterial and venous blood from young anesthetized pigs maintained under steady-state ventilatory conditions [AD-A111834] N82-28945
- GAS DYNAMICS**
- A nonlinear model combining pulmonary mechanics and gas concentration dynamics A82-41230
- GAS EVOLUTION**
- Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria A82-39422
- GAS EXCHANGE**
- The effect of helium on gas exchange and tissue respiration A82-38165
- The use of hyperoxic mixtures for the diagnosis of latent disturbances in the external respiration system A82-40457
- Human external respiration and gas exchange in acute period of adaptation to immersion in water N82-28959
- GAS MIXTURES**
- Formation of cyanate and carbonyl phosphate by electric discharges of model primitive gas A82-38116
- Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats A82-38159
- The use of hyperoxic mixtures for the diagnosis of latent disturbances in the external respiration system A82-40457
- A respirator for training in conditions of changeable respiratory mixture A82-40485
- GASTROINTESTINAL SYSTEM**
- Sword and scalpel --- laser surgery A82-38564
- The diagnostic value of phonoenterography in acute renal failure A82-40478
- Space gastroenterology --- Russian book A82-40643
- GENETIC CODE**
- Ambiguity and the evolution of the genetic code A82-38120

# GENETICS

- Molecular basis for the genetic code A82-41195
- Evolution of early mechanisms of translation of genetic information into polypeptides A82-41324
- GENETICS**
- Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of *Neurospora crassa* A82-38698
- Natural and social determination of human psyche A82-28983
- GEOMAGNETISM**
- Synchronization of cardiovascular accidents with physical clocks A82-28956
- GEOTROPISM**
- Interaction of gravitic and mechanical stimuli in tropic and nastic responses in beans A82-40665
- Initiation of nutation in sunflower hypocotyls A82-40724
- The effect of gravity on the distribution of plant growth substances in plant tissues A82-40746
- Gravity perception and asymmetric growth in plants - A model derived from the grass pulvinus A82-40775
- GLACIERS**
- The microflora of the central Antarctica glacier and control methods for the sterile isolation of an ice core for microbiological analyses A82-39430
- GLANDS (ANATOMY)**
- The histochemistry of enzymes in specific skin glands of the European hedgehog *Erlinaceus europeaus* during hibernation A82-39792
- In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys A82-41214
- GLIDERS**
- Physiological stresses in flying a sailplane A82-38850
- GLOBULINS**
- An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane A82-38607
- GLUCOSE**
- Testosterone enhances C-14 2-deoxyglucose uptake by striated muscle --- sex hormones and muscle [NASA-CR-169101] A82-29886
- Hypo- and hyperglycemia in rats: Effects on the ability to work in the heat [AD-A111711] A82-29849
- GLUCOSIDES**
- Condition of rats connective tissue during long-term hypokinesia and in recovery period A82-28969
- GOGGLES**
- Cold weather goggles. 2: Performance evaluation [AD-A114067] A82-29008
- GRASSES**
- Gravity perception and asymmetric growth in plants - A model derived from the grass pulvinus A82-40775
- GRATINGS**
- Contrast influence on perceived orientation --- of gratings obtained by dichoptic fusion of two monocular images A82-38796
- GRAVIRECEPTORS**
- Gravity sensing, polar transport and cytoplasmic streaming in plant cells A82-40667
- Receptors signaling gravity orientation in an insect A82-40668
- Otoconial complexes as ion reservoirs in endolymph A82-40674
- Gravity sensing system formation in tadpoles *Rana temporaria*/ developed in weightlessness simulation A82-40759
- Gravity only dependent receptor field of the vestibular sensors Its significance in orbital flight A82-40770

# SUBJECT INDEX

- GRAVITATIONAL EFFECTS**
- Gravity and the tilt aftereffect --- comparison between monocular, binocular and interocular exposures A82-39440
- Lockheed involvement in Shuttle life sciences flight experiments A82-39541
- Rapid perceptual adaptation to high gravito-inertial force levels Evidence for context-specific adaptation A82-40436
- Proceedings of a Meeting of the IUPS Commission on Gravitational Physiology --- Book A82-40649
- Gravitational scale effects --- moving organism performance as function of gravity and size A82-40650
- Study of high-g effects in animals A82-40651
- Methodological aspects of future cardiovascular research in space A82-40652
- Research opportunities and limitations of protracted hypogravity simulations for plant gravitational physiology A82-40653
- Human lymphocyte activation is depressed at low-g and enhanced at high-g A82-40658
- Interaction of gravitic and mechanical stimuli in tropic and nastic responses in beans A82-40665
- Gravity sensing, polar transport and cytoplasmic streaming in plant cells A82-40667
- Gravity, metabolic rate and body size of mammals A82-40678
- Simulated gravitational field influences on the aging process A82-40685
- International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980, Proceedings A82-40686
- Aspects of cardiovascular adaptation to gravitational stresses A82-40687
- Artificial gravity in space flight A82-40691
- Effect of spaceflight on lymphocyte stimulation A82-40700
- Variability of physiological properties of rat skeletal muscles at different gravity levels A82-40702
- Gravitational adaptation of animals A82-40716
- Alterations in heat loss and heat production mechanisms in rat exposed to hypergravic fields A82-40718
- Labyrinth plugging as a model of suspended vestibular sensory input A82-40721
- Initiation of nutation in sunflower hypocotyls A82-40724
- Relation between physiological effects of gravitational forces and that of magnetic forces A82-40730
- Postural control related to the different tilting body positions A82-40732
- International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, September 29-October 2, 1981, Proceedings A82-40734
- Reduction in renal artery blood flow impedance during upright tilt in man A82-40735
- Root cell gravireaction - Hormone interaction A82-40745
- The effect of gravity on the distribution of plant growth substances in plant tissues A82-40746
- Results of biosatellite studies of gravity-dependent changes in the musculo-skeletal system of mammals A82-40751
- Cellular aspects of gravitational biology A82-40754

Clinostat exposure and symmetrization of frog eggs  
A82-40757

The intracellular responses of frog eggs to novel  
orientations to gravity A82-40758

Short term gravity effects on volume homeostasis  
in man Assessment of transvascular fluid shifts  
after graded tilt A82-40760

Cardiac and cerebral vascular adaptation to  
gravitational stresses in man A82-40765

Gravity only dependent receptor field of the  
vestibular sensors Its significance in orbital  
flight A82-40770

Relation between physiological effects of  
gravitational forces and that of magnetic  
forces. II A82-40771

Core temperature and brainstem auditory evoked  
potentials as complimentary noninvasive measures  
of central neural function during exposure to  
hypergravic fields A82-40772

Response of cultured cells to hyper- and hypogravity  
A82-40773

Gravity perception and asymmetric growth in plants  
- A model derived from the grass pulvinus A82-40775

Endurance of +Gz G forces by middle-aged people  
before and after 7-day immersion N82-28958

**GROUND CREWS**

Image orientation for RPV ground station crew  
A82-39743

**GROUND STATIONS**

Image orientation for RPV ground station crew  
A82-39743

Human factors of an RPV ground control station  
A82-39749

**GROUND SUPPORT SYSTEMS**

Medical emergencies on board airliners - Ground  
management A82-38846

**GROWTH**

Bone growth and composition in weanling and mature  
rats exposed to chronic centrifugation A82-40669

Bone growth in the rat mandible during space flight  
A82-40705

The effect of gravity on the distribution of plant  
growth substances in plant tissues A82-40746

Evidence for arrested bone formation during  
spaceflight A82-40767

Response of cultured cells to hyper- and hypogravity  
A82-40773

## H

**HAND (ANATOMY)**

The effect of certain characteristics of work  
motions on the tolerance of hand muscles to  
static exertions A82-38568

The conditions attending muscular strain in work  
involving only a few types of movements A82-38569

Workshop on the Design and Control of Dexterous  
Hands  
[AD-A114973] N82-29901

**HAZARDS**

Mechanical chemical and bio-hazards ---  
space-probe related planet and earth  
contaminations A82-39159

**HEAD MOVEMENT**

Dynamics of subjective discomfort in motion  
sickness as measured with a magnitude estimation  
method A82-40438

Gravity only dependent receptor field of the  
vestibular sensors Its significance in orbital  
flight A82-40770

**HEALTH**

An industrial hygiene evaluation of aircraft  
refueling inside closed aircraft shelters at  
elevated ambient temperatures N82-28994  
[AD-A114396]

Airline pilot age, health, and performance:  
Scientific and medical considerations  
[PB82-161506] N82-29895

**HEARING**

Effect of caloric stimulation of vestibular system  
on hearing N82-28963

**HEART**

The regulation of calcium exchange in the cells of  
different regions of the warm-blooded animal heart  
A82-40313

On the observability of electrical cardiac sources  
--- Thesis A82-41450

**HEART DISEASES**

The protective role of the forebrain with respect  
to pathological cardiac reflexes A82-38543

The impulse activity of neurons in the nodose  
ganglion during acute hemodynamic and  
respiratory disorders A82-38546

The detection of premorbid states and  
cardiovascular diseases during medical  
examinations of seamen A82-38553

A study of temporary absences from work arising  
from disorders of the circulatory system A82-38555

Diagnostics of disturbances of heart rhythm and  
conductance and their professional evaluation in  
flight personnel A82-40309

The significance of postextrasystolic potentiation  
in the preoperative assessment of the reversal  
of left-ventricle asynergy in patients with  
ischemic heart disease A82-41483

A modification of Souns' method of selective  
coronary angiography A82-41485

The rate of coronary perfusion as a factor  
determining the extent to which the contractile  
function of the heart is decreased in energy  
formation disorders A82-41489

The achievements of investigations carried out in  
the years 1976-1980 on the problem of  
insufficient blood circulation and heart rhythm  
disturbances A82-41501

Synchronization of cardiovascular accidents with  
physical clocks N82-28956

**HEART FUNCTION**

The effect of repeated episodes of emotional  
stress on heart activity and the content of  
monoamines in the heart A82-38163

The effect of hypokinesia on the resistance of the  
heart to hypoxia A82-38170

Alterations in heart work rhythm during  
hyperactivation of the anterior amygdaline nucleus  
A82-38545

Morphological and functional factors contributing  
to a hypertonic heart A82-38557

A study of the mechanism governing the different  
types of behavior exhibited by the spiral  
excitation wave period in auricle and ventricle  
A82-38597

The effect of inotropic factors on the  
postexercise characteristics of the heart A82-40451

Prevention of heart function abnormalities during  
reoxygenation after ischemia by adaptation to  
altitude hypoxia A82-40455

The effect of hypokinesia on the resistance of the  
heart to hypoxia A82-40502



Effects of lower body negative pressure on the reliability of cardiovascular system using X-ray kymograms

A82-40728

The amplitude of the R wave and the contractile function of the left ventricle in patients with ischemic heart disease

A82-41486

The effect of diethylamine analog of ethmazine on the functional condition of myocardium /Clinical and experimental study/

A82-41488

A comparison of echo- and kinetocardiographic indicators of the myocardial contractility of the left ventricle in patients suffering from various forms of ischemic heart disease

A82-41496

Output and efficiency of the heart in young athletes as a function of the type of athletic training

A82-41497

The role of the energy transport system in changes of the contractile function of the heart in the case of the measured limitation of coronary blood flow

A82-41499

Functional condition of the heart mitochondria in the dynamics of emotional and pain stress

A82-41500

## HEART IMPLANTATION

Selecting optimal conditions for heart conservation in weak aldehyde solutions by using mathematical methods of experimental design

A82-38534

## HEART RATE

Circadian changes in resting heart rate and body temperature, maximal oxygen consumption and perceived exertion

A82-38268

Two phases of the inotropic effect of adrenaline - The calcium dependence

A82-38549

The effect of hyperactivation of the anterior amygdaloid nucleus on heart activity during states of altered reactivity

A82-40454

Vegetative reactions to the administration of atropine and propranolol in rats that exhibit different types of behavior

A82-40463

Increasing the efficiency of running on the basis of learning algorithms and information tools

A82-40488

Instantaneous stroke volume in man during lower body negative pressure /LBNP/

A82-40683

Ventilatory and heart rate responses to hypoxia and hypercapnia during sleep in adults

A82-41206

Slow waves of cardiac rhythm in healthy man under different conditions

N82-28955

## HEAT ACCLIMATIZATION

The effectiveness of perspiration in a hot environment

A82-38178

Physiological studies of heat stress acclimation during a specific exercise regimen

N82-28991

Acclimatization to dry heat: Active men versus active women

N82-28993

## HEAT EXCHANGERS

OTEC biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico

N82-28947

Technical assessment of the prevention of micro-fouling on OTEC heat-transfer surfaces through the use of ultraviolet radiation

N82-29850

## HEAT FLUX

Effect of heating rate on evaporative heat loss in the microwave-exposed mouse

A82-41208

## HEAT MEASUREMENT

Microcalorimetry in biomedical investigations

A82-41471

## HEAT TOLERANCE

Task categorization and the limits of human performance in extreme heat

A82-40439

Acclimatization to dry heat: Active men versus active women

N82-28993

Hypo- and hyperglycemia in rats: Effects on the ability to work in the heat

N82-29849

## HEAT TRANSFER

OTEC-1 power system test program: Biofouling and corrosion monitoring on OTEC-1

N82-29851

Superior heat-transfer fluids for solar heating and cooling applications. Results of acute oral toxicity determinations

N82-29869

## HELICOPTERS

Vibration and assessment of this flight factor by pilots

N82-28976

Helicopter accidents

N82-29876

Backache in helicopter pilots

N82-29887

## HELIUM

The effect of helium on gas exchange and tissue respiration

A82-38165

## HEMATOCRIT

The influence of the speed of blood flow in the carotid artery on the hematocrit of the blood being delivered to the brain

A82-38550

## HEMATOCRIT RATIO

Methodological aspects of testing erythrocyte balance by counting incubated reticulocytes

N82-28972

Effects of low-intensity electromagnetic fields on human and animal erythrocytes

N82-28974

## HEMATOPOIETIC SYSTEM

Changes in the relations of pyrimidine blocks in DNA of the hematopoietic system immediately following gamma irradiation of the animal

A82-38152

Early reaction of the hemopoietic organs depending on the condition of the peripheral M-cholinergic systems

A82-38168

The early reaction of the hemopoietic organs to stress, depending on the condition of the peripheral M-cholinergic systems

A82-40499

## HEMOCYTES

Separation of bone marrow cells in mice by free-flow electrophoresis

A82-38536

## HEMODYNAMIC RESPONSES

The characteristics of hemodynamic shifts under physical stress at mountain elevations

A82-38166

The impulse activity of neurons in the nodose ganglion during acute hemodynamic and respiratory disorders

A82-38546

Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting

A82-40442

The effect of inotropic factors on the postexercise characteristics of the heart

A82-40451

The response of the venous walls in the extremities to a disturbed venous outflow

A82-40493

Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system

A82-40656

Changes in blood volume and response to vaso-active drugs in horizontally casted primates

A82-40657

Cardiovascular responses to isometric exercise during simulated zero gravity

A82-40662

- Cardiovascular responses of the chronically instrumented monkey during simulated space flight  
A82-40670
- Effect of baroreceptor denervation on +G sub z tolerance in dogs  
A82-40675
- Instantaneous stroke volume in man during lower body negative pressure /LBNP/  
A82-40683
- Aspects of cardiovascular adaptation to gravitational stresses  
A82-40687
- Relations between respiratory and circulatory control during gravitational load in man  
A82-40714
- Aortic and tibial bloodflow response to lower body negative pressure /LBNP/  
A82-40727
- Effect of warm-up on left ventricular response to sudden strenuous exercise  
A82-41212
- Metabolic and cardiovascular adaptations in trained hypophysectomized rats  
A82-41215
- The effect of the natural and climatic conditions of the Far North on the human cardiovascular system  
A82-41466
- The effect of ultrasound and phonophoresis of ganglioblockers on the cardiovascular system in patients with cervical osteochondrosis  
A82-41476
- The amplitude of the R wave and the contractile function of the left ventricle in patients with ischemic heart disease  
A82-41486
- The rate of coronary perfusion as a factor determining the extent to which the contractile function of the heart is decreased in energy formation disorders  
A82-41489
- The influence of psychological and somatic factors on the symptoms of hypertension  
A82-41492
- HEMODYNAMICS**
- Changes in the hemodynamics and efferent activity in the renal nerve with acute hypoxic hypoxia under the stabilization of perfusion pressure in carotid sinuses  
A82-38161
- Baroreflex regulation of hemodynamics under orthostatic effects /an investigation with a mathematical model/  
A82-38162
- The dynamics of quantitative changes of RNA in rat cerebellum Purkinje cells in different functional states  
A82-38538
- Comparative study of systemic hemodynamics in normotensive and hypertensive rats  
A82-38542
- The microcirculatory bed of the lungs after an effect exerted on the right vagus nerve  
A82-40497
- The achievements of investigations carried out in the years 1976-1980 on the problem of insufficient blood circulation and heart rhythm disturbances  
A82-41501
- The speed of blood flow in athletes subjected to the combined action of a training regime and high-altitude climatic factors  
A82-41505
- Regulation of cerebral circulation in erect position  
A82-28957
- Reaction to diminished circulating blood volume in individuals who are susceptible and insusceptible to motion sickness (seasickness)  
A82-28960
- HEMOGLOBIN**
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis  
A82-38169
- The combined effect of carbon monoxide and total-body vibration on the organism  
A82-40475
- HEMOLYSIS**
- Effects of low-intensity electromagnetic fields on human and animal erythrocytes  
A82-28974
- HEMOSTATICS**
- Features of microcirculatory hemostasis and of the clotting and fibrinolytic properties of blood and the activity of the antioxidant system in people of various ABO blood groups  
A82-38164
- Evidence of an immune mechanism of enzyme-hemostasis regulation  
A82-38552
- HEPARINS**
- Immunological reactions to lipoproteins and heparin in young men with a hereditary tendency to atherosclerosis  
A82-41487
- HEREDITY**
- Immunological reactions to lipoproteins and heparin in young men with a hereditary tendency to atherosclerosis  
A82-41487
- HEURISTIC METHODS**
- An overview of expert systems --- artificial intelligence  
[NASA-CR-169197]  
A82-29899
- HEXOSES**
- Condition of rats connective tissue during long-term hypokinesia and in recovery period  
A82-28969
- HIBERNATION**
- The histochemistry of enzymes in specific skin glands of the European hedgehog /Erinaceus europeus/ during hibernation  
A82-39792
- The physiological mechanisms of the arousal response in animals under conditions of hypobiosis  
A82-40311
- HIGH ALTITUDE**
- Neutron radiation dosimetry in high altitude flight personnel  
A82-40444
- Attenuation of radioprotective effects of acute hypoxia on animals adapted to high altitudes  
A82-29855
- Alcohol-induced physiological displacements and their effects on flight related functions  
[AD-A114919]  
A82-29867
- HIGH ALTITUDE BREATHING**
- Changes in the hemodynamics and efferent activity in the renal nerve with acute hypoxic hypoxia under the stabilization of perfusion pressure in carotid sinuses  
A82-38161
- Altitude-induced changes in plasma thyroxine, 3,5,3 prime-triiodothyronine, and thyrotropin in rats  
A82-41207
- HIGH ALTITUDE ENVIRONMENTS**
- The characteristics of hemodynamic shifts under physical stress at mountain elevations  
A82-38166
- Causes of high-altitude acute pulmonary edema  
A82-38167
- The accuracy of venturi masks at altitude  
A82-40445
- The cause of high-altitude acute pulmonary edema  
A82-40498
- The speed of blood flow in athletes subjected to the combined action of a training regime and high-altitude climatic factors  
A82-41505
- HIGH GRAVITY ENVIRONMENTS**
- Human lymphocyte activation is depressed at low-g and enhanced at high-g  
A82-40658
- Centrifuge high-g effects on temperature regulation in unanesthetized rats  
A82-40671
- Core temperature and brainstem auditory evoked potentials as complimentary noninvasive measures of central neural function during exposure to hypergravic fields  
A82-40772
- Response of cultured cells to hyper- and hypogravity  
A82-40773

## HIGH PRESSURE

## SUBJECT INDEX

## HIGH PRESSURE

Possible impairment of respiratory regulation  
under hyperbaric nitrogen narcosis  
A82-28964

## HIGH TEMPERATURE ENVIRONMENTS

The effectiveness of perspiration in a hot  
environment  
A82-38178

Task categorization and the limits of human  
performance in extreme heat  
A82-40439

Thermoregulation and the menstrual cycle  
A82-40441

Effect of physical training in cool and hot  
environments on +Gz acceleration tolerance in  
women  
A82-40664

## HIPPOCAMPUS

The influence of a constant magnetic field on the  
epileptogenic foci in the hippocampus of rabbits  
A82-40466

The effect of the electrical stimulation of  
afferent pathways on neurons in septal slices  
A82-40469

## HISTAMINES

Histamine in biochemistry and physiology ---  
Russian book  
A82-39290

## HISTOCHEMICAL ANALYSIS

Histochemical changes in experimental animals  
exposed to variable noise  
A82-38577

Alterations of histochemical organization in the  
organ of Corti under the influence of chronic  
noise  
A82-39242

The histochemistry of enzymes in specific skin  
glands of the European hedgehog /Erinaceus  
europaeus/ during hibernation  
A82-39792

Changes in neurons of the spinal cord and spinal  
ganglia under hypokinesia /neuromorphological  
and histochemical investigation/  
A82-40494

A hygienic evaluation of the biological effects of  
nonionizing microwave radiation  
A82-41464

## HOMEOSTASIS

Evidence of an immune mechanism of  
enzyme-hemostasis regulation  
A82-38552

Systemic mechanisms of homeostasis  
A82-39417

Short term gravity effects on volume homeostasis  
in man Assessment of transvascular fluid shifts  
after graded tilt  
A82-40760

Effect of high ambient temperature on carbohydrate  
metabolism in rat liver and skeletal muscles  
A82-28975

## HORIZONTAL ORIENTATION

Changes in blood volume and response to  
vaso-active drugs in horizontally casted primates  
A82-40657

Influences of horizontal hypokinesia on  
performance and circadian physiological rhythms  
in female humans  
A82-40682

## HORMONE METABOLISMS

Experimental and clinical study of a new  
immunoregulatory preparation - thymalin  
A82-38177

Delayed effects of the internal irradiation of  
endocrine system in female rats  
A82-38582

Stress in space flight - Metabolic aspects  
A82-40696

ADH suppression under immersion combined with  
dehydration --- antidiuretic hormone secretion  
A82-40776

Altitude-induced changes in plasma thyroxine,  
3,5,3 prime-triiodothyronine, and thyrotropin in  
rats  
A82-41207

Metabolic and cardiovascular adaptations in  
trained hypophysectomized rats  
A82-41215

## HORMONES

The regulation of calcium exchange in the cells of  
different regions of the warm-blooded animal heart  
A82-40313

Changes in mineralized tissues in the case of  
calcitonin and somatotrophic hormone injections  
under hypokinesia  
A82-40503

Root cell gravireaction - Hormone interaction  
A82-40745

The effect of gravity on the distribution of plant  
growth substances in plant tissues  
A82-40746

Monograph on new direction of chemistry and  
biology of peptide and protein bioregulators  
reviewed  
A82-28979

Testosterone enhances C-14 2-deoxyglucose uptake  
by striated muscle --- sex hormones and muscle  
[NASA-CR-169101]  
A82-28986

## HOT WEATHER

Effect of physical training in cool and hot  
environments on +Gz acceleration tolerance in  
women  
A82-40664

## HUMAN BEHAVIOR

A test for the prediction of risk-taking attitude  
in operators  
A82-40449

Certain psychological and tactical aspects of  
athlete activities during competitions  
A82-41506

## HUMAN BEINGS

A method of evaluating the functional state of the  
central nervous system of a person performing work  
A82-38579

Model of the accommodative mechanism in the human  
eye  
A82-39432

Natural and social determination of human psyche  
A82-28983

## HUMAN BODY

Changes in man's constant electric field in the  
course of adaptation to hypokinesia  
A82-38595

As if in weightlessness --- simulation through  
hypnosis  
A82-40474

Somatotypology and athletics  
A82-40486

Peculiarities of the relief of the trabecular  
surface of the spongy substance of the human  
vertebrae  
A82-40492

Segmentation and analysis of stereophotometric  
body surface data  
[AD-A114916]  
A82-29868

Anatomy of the spine  
A82-29871

Biomechanics of the spine  
A82-29872

## HUMAN FACTORS ENGINEERING

Achievements and possibilities in the research  
being carried out to protect workers in the 11th  
five-year plan from noise and vibration  
A82-38573

Human factors of an RPV ground control station  
A82-39749

From a man-machine system to a social-engineering  
system  
A82-40447

Psychological investigation of pilot behavior  
during integration of control systems in the  
cockpit of passenger airliners --- German thesis  
A82-40560

Human factor and flight safety  
A82-40885

Vibration and assessment of this flight factor by  
pilots  
A82-28976

Thermal garment  
[NASA-CASE-XNS-03694-1]  
A82-29002

Cold weather goggles. 2: Performance evaluation  
[AD-A114067]  
A82-29008

Flight crewmember workload evaluation  
[AD-A114167]  
A82-29012

**HUMAN PATHOLOGY**

The protective role of the forebrain with respect to pathological cardiac reflexes A82-38543

Diagnosis and organization of the therapy of patients with disorders of blood circulation in the brain A82-38554

A study of temporary absences from work arising from disorders of the circulatory system A82-38555

Use of the thermovision method in the prophylactic examination of polar workers A82-38565

Central nervous dysfunctions after near-miss accidents in diving A82-40443

The achievements of investigations carried out in the years 1976-1980 on the problem of insufficient blood circulation and heart rhythm disturbances A82-41501

Physiopathology and pathology of spinal injuries in aerospace medicine [AGARD-AG-250(ENG)] N82-29870

**HUMAN PERFORMANCE**

Factors of the natural resistance of the body and methods for studying them A82-40308

Task categorization and the limits of human performance in extreme heat A82-40439

Thermoregulation and the menstrual cycle A82-40441

Physical activity and human requirements for energy and food substances A82-40487

Running in circles --- track radius effects on human running speed A82-40661

Mode of mutual influence of stimulation-characteristics in the visual processing system --- German thesis A82-41445

The assimilation of vitamin C in seamen during voyages at high latitudes A82-41465

Adaptive motivation theory [AD-A111195] N82-28997

On models and methods for performance measurement [AD-A113578] N82-28998

Task analysis and the ability requirements of tasks: Collected papers [AD-A111181] N82-29000

The ranking of displays based on transinformation --- as a measure of tracking performance [FB-52] N82-29001

**HUMAN REACTIONS**

Physiological and hygienic analysis of the response of young truck drivers to their work load A82-38567

Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating A82-38795

Dynamics of subjective discomfort in motion sickness as measured with a magnitude estimation method A82-40438

Psychic stress in athletic activity A82-40489

Certain psychological and tactical aspects of athlete activities during competitions A82-41506

Human external respiration and gas exchange in acute period of adaptation to immersion in water N82-28959

Reaction to diminished circulating blood volume in individuals who are susceptible and insusceptible to motion sickness (seasickness) N82-28960

**HUMAN TOLERANCES**

The effect of certain characteristics of work motions on the tolerance of hand muscles to static exertions A82-38568

Dynamics of subjective discomfort in motion sickness as measured with a magnitude estimation method A82-40438

Subjective response to negative air ion exposure A82-40446

Ultra-high impact free-fall survival A82-40684

The tolerance to physical loads in women during menopause complicated by climacteric neurosis with cardialgia A82-41495

Spinal stresses in flight N82-29873

Parachuting N82-29878

Limits of human tolerance for impacts in free fall N82-29879

**HUMIDITY**

Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments A82-40440

**HYDRATION**

The temperature dependence of the H-1 NMR spectrum of hydrated collagen A82-38611

**HYDRAZINES**

The consequences of hydrazine exposition and its treatment [MBL-1981-2] N82-28996

**HYDROCYANIC ACID**

Uracil synthesis via HCN oligomerization --- chemical evolution of biomolecules in primitive earth A82-38117

Acceleration of HCN oligomerization by formaldehyde and related compounds - Implications for prebiotic syntheses A82-41199

**HYDROGEN BONDS**

The temperature dependence of the H-1 NMR spectrum of hydrated collagen A82-38611

**HYDROGENATION**

Metabolism of the thermophilic hydrogenous bacterium Pseudomonas thermophila K-2 A82-39427

**HYDROLYSIS**

Uracil synthesis via HCN oligomerization --- chemical evolution of biomolecules in primitive earth A82-38117

**HYDROTHERMAL SYSTEMS**

Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria A82-39422

**HYGIENE**

Physiological and hygienic analysis of the response of young truck drivers to their work load A82-38567

Setting hygienic standards to be applied to environmental standards pertaining to the rolling stock of railroads and subway systems A82-38578

**HYOSCINE**

Antimotion-sickness efficacy of scopolamine 12 and 72 hours after transdermal administration A82-40437

Neurochemical background and approaches in the understanding of motion sickness [NASA-CR-3569] N82-29865

**HYPERCAPNIA**

The accuracy of venturi masks at altitude A82-40445

Ventilatory and heart rate responses to hypoxia and hypercapnia during sleep in adults A82-41206

Pulmonary stretch receptor discharge patterns in eupnea, hypercapnia, and hypoxia A82-41210

Possible impairment of respiratory regulation under hyperbaric nitrogen narcosis N82-28964

**HYPERGLYCEMIA**

Hypo- and hyperglycemia in rats: Effects on the ability to work in the heat [AD-A111711] N82-29849

# HYPEROXIA

# SUBJECT INDEX

## HYPEROXIA

- Enzymes that detoxify active forms of oxygen and lipoperoxide in experimental ischemia and myocardial infarction A82-38540
- The use of hyperoxic mixtures for the diagnosis of latent disturbances in the external respiration system A82-40457
- Protection from O2 toxicity by preexposure to hypoxia - Lung antioxidant enzyme role A82-41217

## HYPERTENSION

- Comparative study of systemic hemodynamics in normotensive and hypertensive rats A82-38542
- A study of temporary absences from work arising from disorders of the circulatory system A82-38555
- Morphological and functional factors contributing to a hypertonic heart A82-38557
- Echocardiographic characterization of heart hypertension A82-40307
- State of adaptation in patients with hypertension A82-40476
- The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension A82-40477
- The influence of psychological and somatic factors on the symptomatics of hypertension A82-41492
- Telemetry methods for monitoring physiological parameters A82-41551

## HYPERTHERMIA

- The effect of serotonin on the development of acute hyperthermia in rats A82-38583
- The toxic properties of rabbit and dog sera under controlled hyperthermia A82-40458

## HYPNOSIS

- As if in weightlessness --- simulation through hypnosis A82-40474

## HYPODYNAMIA

- Effect of athletic training on physical fitness under hypodynamics A82-40663

## HYPOGLYCEMIA

- Hypo- and hyperglycemia in rats: Effects on the ability to work in the heat [AD-A111711] N82-29849

## HYPOKINESIA

- Early reaction of the hemopoietic organs depending on the condition of the peripheral M-cholinergic systems A82-38168
- The effect of hypokinesia on the resistance of the heart to hypoxia A82-38170
- Serotonin content of peripheral organs and tissues in rats under normal conditions and under stress during postnatal development A82-38584
- Changes in man's constant electric field in the course of adaptation to hypokinesia A82-38595
- The anti-stress role of the gamma-aminobutyric acid system of the brain A82-40468
- Changes in neurons of the spinal cord and spinal ganglia under hypokinesia /neuromorphological and histochemical investigation/ A82-40494
- The early reaction of the hemopoietic organs to stress, depending on the condition of the peripheral M-cholinergic systems A82-40499
- The effect of hypokinesia on the resistance of the heart to hypoxia A82-40502
- Changes in mineralized tissues in the case of calcitonin and somatotrophic hormone injections under hypokinesia A82-40503

- Influences of horizontal hypokinesia on performance and circadian physiological rhythms in female humans A82-40682
  - A new rat model for studies of hypokinesia and antiorthostasis A82-40706
  - Na<sup>+</sup>/K<sup>+</sup> dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats A82-40707
  - Effect of immobilization on the ATPase activities and Ca-uptake of sarcoplasmic reticulum in different types of muscles A82-40708
  - Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness A82-40709
  - Effect of immobilization of the excitatory parameters of different type skeletal muscle A82-40710
  - The effect of hypokinesia and hypoxia on the function of muscles A82-40739
  - Antiorthostatic hypokinesia and circulation in the rat A82-40741
  - Suspension restraint - Induced hypokinesia and antiorthostasis as a simulation of weightlessness A82-40744
  - Restraint of animals in space research A82-40748
  - Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle A82-41209
  - Skeletal abnormalities in rats induced by simulated weightlessness A82-41548
  - Condition of rats connective tissue during long-term hypokinesia and in recovery period N82-28969
- ## HYPOTHALAMUS
- The protective role of the forebrain with respect to pathological cardiac reflexes A82-38543
  - The cholinergic nature of hypothalamo-cortical excitatory influence A82-38551
  - Approaches to the study of the hypothalamus-pituitary gland relationship A82-39569
- ## HYPOXIA
- Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats A82-38159
  - Changes in the hemodynamics and efferent activity in the renal nerve with acute hypoxic hypoxia under the stabilization of perfusion pressure in carotid sinuses A82-38161
  - The characteristics of hemodynamic shifts under physical stress at mountain elevations A82-38166
  - The effect of hypokinesia on the resistance of the heart to hypoxia A82-38170
  - Study of RNA synthesis rate and DNA content in the myocardium of new-born rats during adaptation to high-altitude hypoxia A82-38537
  - The participation of the lymphatic system in the resistance of an organism to hypoxia A82-39793
  - Prevention of heart function abnormalities during reoxygenation after ischemia by adaptation to altitude hypoxia A82-40455
  - The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-40501
  - The effect of hypokinesia on the resistance of the heart to hypoxia A82-40502
  - The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats A82-40713

- The effect of hypokinesia and hypoxia on the function of muscles  
A82-40739
- Ventilatory and heart rate responses to hypoxia and hypercapnia during sleep in adults  
A82-41206
- Altitude-induced changes in plasma thyroxine, 3,5,3 prime-triiodothyronine, and thyrotropin in rats  
A82-41207
- Pulmonary stretch receptor discharge patterns in eupnea, hypercapnia, and hypoxia  
A82-41210
- Protection from O2 toxicity by preexposure to hypoxia - Lung antioxidant enzyme role  
A82-41217
- Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218
- The rate of coronary perfusion as a factor determining the extent to which the contractile function of the heart is decreased in energy formation disorders  
A82-41489
- Attenuation of radioprotective effects of acute hypoxia on animals adapted to high altitudes  
N82-29855
- ILLUMINATING**  
The flavin-dependent consumption of oxygen in mitochondria under illumination  
A82-38589
- IMAGE CONTRAST**  
Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating  
A82-38795
- Contrast influence on perceived orientation --- of gratings obtained by dichoptic fusion of two monocular images  
A82-38796
- Effect of chromatic adaptation on the achromatic locus - The role of contrast, luminance and background color  
A82-39433
- IMAGE ENHANCEMENT**  
Image orientation for RPV ground station crew  
A82-39743
- IMMOBILIZATION**  
Ultrastructural changes in the brains of rats subjected to acute emotional stress  
A82-38558
- Statistical analysis of neuronal impulse activity in the diencephalon during immobilization-produced emotional stress in rats  
A82-40467
- The early reaction of the hemopoietic organs to stress, depending on the condition of the peripheral M-cholinergic systems  
A82-40499
- Effect of immobilization on the ATPase activities and Ca-uptake of sarcoplasmic reticulum in different types of muscles  
A82-40708
- Effect of immobilization of the excitatory parameters of different type skeletal muscle  
A82-40710
- Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles  
A82-40712
- The effects of human growth hormone administration on the functional status of rat atrophied muscle following immobilization  
A82-40715
- Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization  
A82-40742
- Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle  
A82-41209
- Neuromuscular adaptation in human thenar muscles following strength training and immobilization  
A82-41213
- IMMUNITY**  
Experimental and clinical study of a new immunoregulatory preparation - thymalin  
A82-38177
- Migration kinetics of hemopoietic stem cells in mice after severe mechanical trauma  
A82-38541
- Evidence of an immune mechanism of enzyme-hemostasis regulation  
A82-38552
- The influence of a deficit of vitamins on immunity /A review of the literature/  
A82-41504
- IMMUNOLOGY**  
An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane  
A82-38607
- Factors of the natural resistance of the body and methods for studying them  
A82-40308
- The effect of products erythrocyte destruction on immunological processes  
A82-40500
- Weightlessness effects on resistance and reactivity of animals  
A82-40690
- Effect of spaceflight on lymphocyte stimulation  
A82-40700
- Functional properties of T-lymphocytes in patients with acute myocardial infarction  
A82-41459
- The structure and function of macrophages  
A82-41470
- Immunological reactions to lipoproteins and heparin in young men with a hereditary tendency to atherosclerosis  
A82-41487
- IMPACT ACCELERATION**  
Problem of accelerations in aviation medicine  
N82-28950
- IMPACT DAMAGE**  
Ultra-high impact free-fall survival  
A82-40684
- IMPACT TOLERANCES**  
Limits of human tolerance for impacts in free fall  
N82-29879
- IMPLANTED ELECTRODES (BIOLOGY)**  
Implantable electrical device [NASA-CASE-GSC-12560-1]  
N82-29863
- INDUSTRIAL SAFETY**  
Setting safety standards for ionizing radiation  
A82-38580
- INERTIA**  
Rapid perceptual adaptation to high gravito-inertial force levels Evidence for context-specific adaptation  
A82-40436
- INFORMATION DISSEMINATION**  
The organizing of conferences [PB82-142696]  
N82-28948
- INFORMATION THEORY**  
The ranking of displays based on transinformation --- as a measure of tracking performance [PB-52]  
N82-29001
- INJURIES**  
The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones  
A82-38563
- Limits of human tolerance for impacts in free fall  
N82-29879
- INSECTS**  
USSR report. Life sciences biomedical and behavioral sciences, no. 16 [JPRS-80789]  
N82-28977
- Cultivation of insects as new branch of entomology - industrial entomology  
N82-28980
- INSTRUCTORS**  
Instructor's role in individualized training: A survey of two computer managed courses [AD-A114917]  
N82-29894
- INTELLECT**  
USSR report. Life sciences biomedical and behavioral sciences, no. 16 [JPRS-80789]  
N82-28977



# INTERVERTEBRAL DISKS

# SUBJECT INDEX

Natural and social determination of human psyche  
N82-28983

An overview of expert systems --- artificial intelligence  
[NASA-CR-169197] N82-29899

**INTERVERTEBRAL DISKS**

Validation of a new method for studying the effects of vibration on the primate spine  
A82-40768

Biomechanics of the spine  
N82-29872

**ION CONCENTRATION**

The effect of monovalent cations on the ATPase activity and superprecipitation of actomyosin  
A82-38615

**ION CURRENTS**

Ion currents through a neuron membrane during the injection of cyclic nucleotides  
A82-38588

**ION EXCHANGE MEMBRANE ELECTROLYTES**

The mechanism of the microwave effect on the conductivity of bilayer lipid membranes  
A82-38587

ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation  
A82-40479

**ION EXCHANGING**

Changes in electrically neutral  $Ca^{2+}/-H^{+}/$  exchange in rat liver mitochondria following gamma irradiation  
A82-38151

$Na^{+}/-K^{+}/$  dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats  
A82-40707

**IONIC MOBILITY**

Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions  
A82-38586

Temperature characteristics of the ouabain-insensitive sodium flux in frog muscles  
A82-38600

**IONIZING RADIATION**

Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats  
A82-38159

Equivalent doses, dose rates and times of chronic exposure to ionizing radiation for various mammals  
A82-38160

Setting safety standards for ionizing radiation  
A82-38580

Dynamics of a stabilized motor defensive conditioned reflex for different levels of motivation in irradiated rats  
A82-40464

Cytogenetic analysis of peripheral blood lymphocytes of individuals exposed to low doses of ionizing radiation  
N82-29856

**IRRADIATION**

Optimization of the conditions of modified cell irradiation  
A82-38154

**ISCHEMIA**

Enzymes that detoxify active forms of oxygen and lipoperoxide in experimental ischemia and myocardial infarction  
A82-38540

Local cerebral blood flow dynamics during experimental ischemia  
A82-38544

A study of temporary absences from work arising from disorders of the circulatory system  
A82-38555

The content of cAMP and cGMP in brain tissues during adaptation to ischemia  
A82-40310

Prevention of heart function abnormalities during reoxygenation after ischemia by adaptation to altitude hypoxia  
A82-40455

Involuntary and voluntary mechanisms for preventing cerebral ischemia due to positive  $G_z$  acceleration  
A82-40747

The significance of postextrasystolic potentiation in the preoperative assessment of the reversal of left-ventricle asynergy in patients with ischemic heart disease  
A82-41483

The ultrastructure of the myocardium in the restorative period following aorto-coronary shunting in patients with chronic ischemic heart disease  
A82-41484

The amplitude of the R wave and the contractile function of the left ventricle in patients with ischemic heart disease  
A82-41486

A comparison of echo- and kinetocardiographic indicators of the myocardial contractility of the left ventricle in patients suffering from various forms of ischemic heart disease  
A82-41496

Synchronization of cardiovascular accidents with physical clocks  
N82-28956

**ISOTOPE EFFECT**

Conditions leading to kinetic and thermodynamic isotopic effects in a cell  
A82-38601

## J

**JUDGMENTS**

An overview of expert systems --- artificial intelligence  
[NASA-CR-169197] N82-29899

## K

**KIDNEY DISEASES**

The diagnostic value of phonoenterography in acute renal failure  
A82-40478

**KIDNEYS**

Changes in the hemodynamics and efferent activity in the renal nerve with acute hypoxic hypoxia under the stabilization of perfusion pressure in carotid sinuses  
A82-38161

Reduction in renal artery blood flow impedance during upright tilt in man  
A82-40735

**KINEMATICS**

Workshop on the Design and Control of Dexterous Hands  
[AD-A114973] N82-29901

**KNOWLEDGE**

An overview of expert systems --- artificial intelligence  
[NASA-CR-169197] N82-29899

## L

**LABYRINTH**

Application of xylite for the detection of labyrinthine hydrops  
A82-39243

Labyrinth plugging as a model of suspended vestibular sensory input  
A82-40721

Preparation of labyrinthectomized animals for flight aboard Cosmos-936 biosatellite  
N82-28971

**LABYRINTHECTOMY**

Alterations in the labyrinth receptors after laser irradiation as detected by electron microscopy  
A82-39244

Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration  
A82-40720

Preparation of labyrinthectomized animals for flight aboard Cosmos-936 biosatellite  
N82-28971

**LACTATES**

State of the lactate dehydrogenase reaction in the muscular tissue of irradiated animals  
A82-38158

**LAND ICE**

Mycelial fungi, isolated from the ice sheet of the central Antarctic  
A82-39428

**LASER APPLICATIONS**

- Sword and scalpel --- laser surgery  
A82-38564
- The effect of laser radiation on lipid synthesis  
in yeast  
A82-38585
- Alterations in the labyrinth receptors after laser  
irradiation as detected by electron microscopy  
A82-39244
- Application of laser therapy to patients with  
osteoarthrosis deformans  
A82-41475

**LASER DAMAGE**

- Long-term and progressive changes in Rhesus  
spectral sensitivity after low-level coherent  
light (514nm exposure) --- effects of laser  
exposure on visual function  
[AD-A111639]  
N82-28946

**LASER SPECTROSCOPY**

- A measurement of the size distribution of  
lipoproteins in the plasma of human blood  
A82-38603

**LATERAL STABILITY**

- Workshop on the Design and Control of Dexterous  
Hands  
[AD-A114973]  
N82-29901

**LEARNING**

- Increasing the efficiency of running on the basis  
of learning algorithms and information tools  
A82-40488
- Neurochemical mechanisms of learning and memory  
--- Russian book  
A82-40646
- Adaptive motivation theory  
[AD-A111195]  
N82-28997
- Instructor's role in individualized training: A  
survey of two computer managed courses  
[AD-A114917]  
N82-29894
- An overview of expert systems --- artificial  
intelligence  
[NASA-CR-169197]  
N82-29899

**LEG (ANATOMY)**

- Osteoporosis in unsupported extremities  
N82-28970

**LEGUMINOUS PLANTS**

- Interaction of gravitic and mechanical stimuli in  
tropic and nastic responses in beans  
A82-40665

**LENSES**

- Model of the accommodative mechanism in the human  
eye  
A82-39432

**LESIONS**

- Intrahemispherical relations of EEG slow-wave  
components in patients with local brain lesions  
A82-40472
- Limits of human tolerance for impacts in free fall  
N82-29879

**LEUCINE**

- The radiolysis and racemization of leucine on  
proton irradiation  
A82-38118
- Leucine and urea metabolism in acute human cold  
exposure  
A82-41211

**LIFE SCIENCES**

- Lockheed involvement in Shuttle life sciences  
flight experiments  
A82-39541
- USSR report. Life sciences. Biomedical and  
behavioral sciences, no. 18  
[JPRS-81428]  
N82-29857

**LIFE SPAN**

- Radiation-induced shortening of the life span of  
D. melanogaster. II - Sensitizing effects of  
5-bromo-2-deoxyuridine  
A82-38155

**LIFE SUPPORT SYSTEMS**

- Nutrition and food technology for a Controlled  
Ecological Life Support System (CELSS)  
[NASA-CR-167392]  
N82-29004
- A design methodology for nonlinear systems  
containing parameter uncertainty: Application  
to nonlinear controller design  
[NASA-CR-166358]  
N82-29005
- Preprototype independent air revitalization  
subsystem  
[NASA-CR-167703]  
N82-29898

**LIGANDS**

- Thermodynamic parameters characterizing  
interaction between polymer-absorbed ligand  
molecules  
A82-38609
- Ligation of oligonucleotides by pyrimidine dimers  
- A missing 'link' in the origin of life  
A82-39423

**LIGHT ADAPTATION**

- Effect of chromatic adaptation on the achromatic  
locus - The role of contrast, luminance and  
background color  
A82-39433

**LIGHT AIRCRAFT**

- Aerobatics in light aircraft - Sensations and  
stresses experienced by the pilot  
A82-38848
- In-flight incapacitation and pathology for the  
light aircraft stunt-flyer  
A82-38851

**LIGHT CURVE**

- Light curves for photosynthesis under intermittent  
illumination  
A82-38608

**LIGHT EMITTING DIODES**

- An LED system for the formation of visual stimuli  
A82-40471

**LIMBS (ANATOMY)**

- Osteoporosis in unsupported extremities  
N82-28970

**LINE OF SIGHT**

- Unconventional visual displays for flight training  
[AD-A11392]  
N82-28999

**LINES (GEOMETRY)**

- Effects of reference lines on displacement  
thresholds at various durations of movement ---  
in human visual perception  
A82-38797

**LIPID METABOLISM**

- Study of the relation between the number of  
sulfhydryl groups and the level of lipid  
antioxidant activity in the organs of individual  
animals of different species  
A82-38153
- Studies of specific hepatic enzymes involved in  
the conversion of carbohydrates to lipids in  
rats exposed to prolonged spaceflight aboard  
Cosmos 1129  
A82-40698

- Space flight effects upon plasma and tissue lipids  
in rats  
A82-40722

**LIPIDS**

- The effect of laser radiation on lipid synthesis  
in yeast  
A82-38585
- The mechanism of the microwave effect on the  
conductivity of bilayer lipid membranes  
A82-38587
- A comparison between the protonophoric and  
separating functions of weak dibasic acids ---  
in mitochondrial respiration  
A82-38590
- A possible explanation for the fluctuations in  
reflectivity exhibited by bilayer lipid  
membranes excited during electrostriction  
A82-38602
- The incorporation of an erythrocyte membrane into  
planar bilayer lipid membranes  
A82-38606

**LIPOPROTEINS**

- Determination of blood-lipoprotein dimensions by  
optical methods  
A82-38593
- A measurement of the size distribution of  
lipoproteins in the plasma of human blood  
A82-38603
- The conductivity of model protein-lipid membranes  
A82-38604
- Immunological reactions to lipoproteins and  
heparin in young men with a hereditary tendency  
to atherosclerosis  
A82-41487

**LIQUID COOLING**

- Auxiliary cooling - Comparison of air-cooled vs.  
water-cooled vests in hot-dry and hot-wet  
environments  
A82-40440

## LIQUID-LIQUID INTERFACES

An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane

A82-38607

## LIVER

Changes in electrically neutral  $\text{Ca}^{2+}$ -H<sup>+</sup>/H<sup>+</sup> exchange in rat liver mitochondria following gamma irradiation

A82-38151

Diurnal changes in the duration of the S and G2 phases of the mitotic cycle in mononuclear and binuclear hepatocytes of normal and thyroxine-treated rats

A82-40459

## LONG DURATION SPACE FLIGHT

Dynamics of weight loss during prolonged spaceflight

A82-40673

Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat

A82-40699

Dynamics of left ventricular systolic phase structure during long-term (140-185 days) spaceflights

N82-28954

## LONG WAVE RADIATION

The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice

A82-38556

## LOWER BODY NEGATIVE PRESSURE

Cardiovascular responses of the chronically instrumented monkey during simulated space flight

A82-40670

Instantaneous stroke volume in man during lower body negative pressure /LBNP/

A82-40683

Aortic and tibial bloodflow response to lower body negative pressure /LBNP/

A82-40727

Effects of lower body negative pressure on the reliability of cardiovascular system using X-ray kymograms

A82-40728

## LUMINANCE

Hyperacuity for luminance phase angle in the human visual system

A82-38799

Effect of chromatic adaptation on the achromatic locus - The role of contrast, luminance and background color

A82-39433

## LUNG MORPHOLOGY

The cause of high-altitude acute pulmonary edema

A82-40498

## LUNGS

The microcirculatory bed of the lungs after an effect exerted on the right vagus nerve

A82-40497

Effect of sustained Gz acceleration on lung fluid balance - An ultrastructural study

A82-40761

A nonlinear model combining pulmonary mechanics and gas concentration dynamics

A82-41230

## LYMPH

The participation of the lymphatic system in the resistance of an organism to hypoxia

A82-39793

The effect of leikenkephalin and thyroxine on the lymphatic and blood microvessels

A82-41490

## LYMPHOCYTES

Radiation damage and recovery of mouse T-cells. IV - Elimination of radiation-induced migration abnormalities in T-lymphocytes

A82-38156

Experimental and clinical study of a new immunoregulatory preparation - thymalin

A82-38177

Migration kinetics of hemopoietic stem cells in mice after severe mechanical trauma

A82-38541

Human lymphocyte activation is depressed at low-g and enhanced at high-g

A82-40658

Effect of spaceflight on lymphocyte stimulation

A82-40700

Gravitational adaptation of animals

A82-40716

Response of cultured cells to hyper- and hypogravity

A82-40773

Functional properties of T-lymphocytes in patients with acute myocardial infarction

A82-41459

Cytogenetic analysis of peripheral blood lymphocytes of individuals exposed to low doses of ionizing radiation

N82-29856

## M

## MACROPHAGES

The structure and function of macrophages

A82-41470

## MACROSCOPIC EQUATIONS

Attributing macroscopic fluctuations in aqueous solutions of proteins and other substances to the class of flicker noise

A82-38592

## MAGNETIC EFFECTS

The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase

A82-38591

Relation between physiological effects of gravitational forces and that of magnetic forces

A82-40730

Relation between physiological effects of gravitational forces and that of magnetic forces. II

A82-40771

The use of an audio-frequency magnetic field in certain diseases

A82-41473

Present-day magnetic-field sources, used in medical treatment

A82-41481

## MAGNETIC FIELDS

Sources of an artificial magnetic field for implantation /experimental study/

A82-41480

Present-day magnetic-field sources, used in medical treatment

A82-41481

A device for producing the action of static magnetic fields on biological objects

A82-41482

## MAGNETS

Sources of an artificial magnetic field for implantation /experimental study/

A82-41480

A device for producing the action of static magnetic fields on biological objects

A82-41482

## MAMMALS

Low-G simulation in mammalian research

A82-40654

Gravity, metabolic rate and body size of mammals

A82-40678

Restraint of animals in space research

A82-40748

## MAN MACHINE SYSTEMS

Experimentally determined pilot models using hovering VTOL flight data

A82-40277

[AIAA PAPER 82-1294]

From a man-machine system to a social-engineering system

A82-40447

Rule-based programming for human-computer interface specification

N82-29007

An overview of expert systems --- artificial intelligence

N82-29899

Human/computer transaction tasks: An annotated bibliography

N82-29902

[AD-A114800]

## MANIPULATORS

Robotics: Problems and prospects

A82-40473

## MANNED ORBITAL LABORATORIES

Initial audiometric investigations in an orbital station

N82-30277

## MANNED SPACE FLIGHT

Space gastroenterology --- Russian book

A82-40643

- Results of investigations of weightlessness effects during prolonged manned space flights onboard Salyut-6  
A82-40750
- Nutrition and food technology for a Controlled Ecological Life Support System (CELSS) [NASA-CR-167392]  
N82-29004
- An approach to the preliminary evaluation of Closed Ecological Life Support System (CELSS) scenarios and control strategies [NASA-CR-166368]  
N82-29897
- Twenty years of manned space flight from the viewpoint of space medicine  
N82-30276
- HANDLING CONTROL**  
Biomechanical analysis of tasks involving manual materials handling [AD-A113955]  
N82-29009
- HAPPING**  
Training of personnel specialized in cartography  
N82-29669
- MARINE BIOLOGY**  
Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria  
A82-39422
- MARINE ENVIRONMENTS**  
The assimilation of vitamin C in seamen during voyages at high latitudes  
A82-41465
- MAROV PROCESSES**  
Rule-based programming for human-computer interface specification [AD-A113036]  
N82-29007
- MASSAGING**  
Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting  
A82-40442
- MATERIALS HANDLING**  
Biomechanical analysis of tasks involving manual materials handling [AD-A113955]  
N82-29009
- MATHEMATICAL MODELS**  
A model for the origin of life  
A82-41198
- On models and methods for performance measurement [AD-A113578]  
N82-28998
- MECHANICAL DRIVES**  
Control of a direct-drive arm [AD-A114969]  
N82-29903
- MECHANICAL PROPERTIES**  
Effect of space flight on bone strength  
A82-40680
- MECHANICAL SHOCK**  
Interaction of gravitic and mechanical stimuli in tropic and nastic responses in beans  
A82-40665
- MEDICAL EQUIPMENT**  
Thermal pulsation - Techniques, demonstration, and clinical application  
A82-41474
- Present-day magnetic-field sources, used in medical treatment  
A82-41481
- A device for producing the action of static magnetic fields on biological objects  
A82-41482
- USSR report. Life sciences biomedical and behavioral sciences, no. 16 [JPRS-80789]  
N82-28977
- Microelectronic electrode probe for testing brain electrical activity  
N82-28982
- Acoustic tooth cleaner [NASA-CASE-LAR-12471-1]  
N82-29862
- MEDICAL PHENOMENA**  
Microcalorimetry in biomedical investigations  
A82-41471
- MEDICAL SCIENCE**  
USSR report. Life sciences. Biomedical and behavioral sciences, no. 17 [JPRS-81419]  
N82-29853
- USSR report. Life sciences. Biomedical and behavioral sciences, no. 18 [JPRS-81428]  
N82-29857
- MEDICAL SERVICES**  
Medical emergencies on board airliners - Ground management  
A82-38846
- MEMBRANES**  
Ion currents through a neuron membrane during the injection of cyclic nucleotides  
A82-38588
- A possible explanation for the fluctuations in reflectivity exhibited by bilayer lipid membranes excited during electrostriction  
A82-38602
- The conductivity of model protein-lipid membranes  
A82-38604
- Gramicidin A-induced conductance of the muscle fiber membrane  
A82-38605
- The incorporation of an erythrocyte membrane into planar bilayer lipid membranes  
A82-38606
- The utilization of macromolecules in blood purification systems [NRC/CNR-TT-2021]  
N82-29864
- MEMORY**  
Neurochemical mechanisms of learning and memory --- Russian book  
A82-40646
- MENSTRUATION**  
Thermoregulation and the menstrual cycle  
A82-40441
- The tolerance to physical loads in women during menopause complicated by climacteric neurosis with cardialgia  
A82-41495
- MENTAL PERFORMANCE**  
Task analysis and the ability requirements of tasks: Collected papers [AD-A111181]  
N82-29000
- Airline pilot age, health, and performance: Scientific and medical considerations [PB82-161506]  
N82-29895
- Quantification of pilot workload via instrument scan [NASA-CR-169238]  
N82-29900
- METABOLIC DISEASES**  
Hygienic evaluation of an 8-mm-wave electromagnetic field  
A82-41462
- METABOLISM**  
Evolution of major metabolic innovations in the Precambrian  
A82-38121
- Metabolism of the thermophilic hydrogenous bacterium *Pseudomonas thermophila* K-2  
A82-39427
- Trace reactions of the frog tissue metabolism on changes of ambient temperature in the frog *Rana ridibunda* Pall  
A82-40316
- The role of nutrition in the changes of energy metabolism during stress  
A82-40482
- Effect of simulated weightlessness on energy metabolism in the rat  
A82-40677
- Gravity, metabolic rate and body size of mammals  
A82-40678
- Acid-base, metabolic, and ventilatory responses to repeated bouts of exercise  
A82-41219
- Tritium oxide distribution and excretion kinetics in the exposure of animals to noise  
A82-41463
- METAL IONS**  
The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase  
A82-38591
- METHYL COMPOUNDS**  
The radiolysis of aqueous propionitrile - Compounds of interest to chemical evolution studies  
A82-41197
- METROLOGY**  
Problems in the metrology of the training load of ski racers  
A82-41502

# MICROBIOLOGY

# SUBJECT INDEX

## MICROBIOLOGY

On the mathematical modelling of microbial age dynamic and some control aspects of microbial growth processes

A82-38823

Mycelial fungi, isolated from the ice sheet of the central Antarctic

A82-39428

The microflora of the central Antarctica glacier and control methods for the sterile isolation of an ice core for microbiological analyses

A82-39430

## MICROELECTRONICS

Robotics: Problems and prospects

A82-40473

## MICROINSTRUMENTATION

Microcalorimetry in biomedical investigations

A82-41471

## MICROORGANISMS

The microflora of the central Antarctica glacier and control methods for the sterile isolation of an ice core for microbiological analyses

A82-39430

USSR report. Life sciences biomedical and behavioral sciences, no. 16 [JPRS-80789]

N82-28977

Microorganisms used to monitor environmental pollution

N82-28978

## MICROSTRUCTURE

Peculiarities of the relief of the trabecular surface of the spongy substance of the human vertebrae

A82-40492

## MICROWAVES

Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions

A82-38586

The mechanism of the microwave effect on the conductivity of bilayer lipid membranes

A82-38587

Effect of heating rate on evaporative heat loss in the microwave-exposed mouse

A82-41208

## MILLIMETER WAVES

Hygienic evaluation of an 8-mm-wave electromagnetic field

A82-41462

## MINERAL METABOLISM

Chronic central vascular expansion induces hypokalemia in conscious primates

A82-40719

Osteoporosis in unsupported extremities

N82-28970

## MITOCHONDRIA

Changes in electrically neutral  $Ca^{2+}$ -H<sup>+</sup>/H<sup>+</sup> exchange in rat liver mitochondria following gamma irradiation

A82-38151

The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis

A82-38169

The flavin-dependent consumption of oxygen in mitochondria under illumination

A82-38589

A comparison between the protonophoric and separating functions of weak dibasic acids --- in mitochondrial respiration

A82-38590

Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of *Neurospora crassa*

A82-38698

Some of biochemical parameters in rat brain during +Gz acceleration

A82-40717

Functional condition of the heart mitochondria in the dynamics of emotional and pain stress

A82-41500

## MITOSIS

Mitotic activity and volume of epithelial cell nuclei of rat cornea following spaceflights in biosatellites

N82-28965

## MOLECULAR BIOLOGY

Clay and the origin of life

A82-38115

Uracil synthesis via HCN oligomerization --- chemical evolution of biomolecules in primitive earth

A82-38117

Polynucleotide replication coupled to protein synthesis A possible mechanism for the origin of life

A82-38119

An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane

A82-38607

Thermodynamic parameters characterizing interaction between polymer-absorbed ligand molecules

A82-38609

Conformational dynamics of proteins and simplest molecular 'machines'

A82-38610

Molecular basis for the genetic code

A82-41195

A new hypothesis for the mechanism of muscle contraction

A82-41334

## MOLECULAR DIFFUSION

Conformational dynamics of proteins and simplest molecular 'machines'

A82-38610

## MOLECULAR SPECTRA

The temperature dependence of the H-1 NMR spectrum of hydrated collagen

A82-38611

## MOLECULAR STRUCTURE

The radiolysis and racemization of leucine on proton irradiation

A82-38118

F-actin is a helix with a random variable twist

A82-38694

## MOLECULES

The utilization of macromolecules in blood purification systems

N82-29864

## MONOCULAR VISION

Gravity and the tilt aftereffect --- comparison between monocular, binocular and interocular exposures

A82-39440

## MONITORILLONITE

Chemical evolution. XL - Clay-mediated oxidation of diaminomaleonitrile

A82-41196

## MORPHOLOGY

Somatotypology and athletics

A82-40486

Cytoarchitectonics of the epidermis and the epidermal proliferative units /EPU/

A82-40491

The response of the venous walls in the extremities to a disturbed venous outflow

A82-40493

Ultrastructural qualitative and quantitative evaluation of cytoplasmatic structures of heart muscle of rats living aboard biosputnik Kosmos 936

A82-40694

Results of morphological investigations aboard biosatellites Cosmos

A82-40697

The ultrastructure of the myocardium in the restorative period following aorto-coronary shunting in patients with chronic ischemic heart disease

A82-41484

## MOTION

Retinal location and visual localization during pursuit eye movement

A82-39436

## MOTION AFTEREFFECTS

Gravity and the tilt aftereffect --- comparison between monocular, binocular and interocular exposures

A82-39440

## MOTION PERCEPTION

Effects of reference lines on displacement thresholds at various durations of movement --- in human visual perception

A82-38797

- Neurons in cat visual cortex tuned to the direction of motion in depth - Effect of positional disparity A82-39434
- Characteristics of human auditory evoked potentials during the lateralization of a 'moving' auditory image A82-40465
- MOTION SICKNESS**
- Antimotion-sickness efficacy of scopolamine 12 and 72 hours after transdermal administration A82-40437
- Dynamics of subjective discomfort in motion sickness as measured with a magnitude estimation method A82-40438
- Vestibular effects of water immersion and Clonidine A82-40762
- Reaction to diminished circulating blood volume in individuals who are susceptible and insusceptible to motion sickness (seasickness) A82-28960
- Significance of minute volume parameters to evaluation of vestibular stability A82-29860
- Neurochemical background and approaches in the understanding of motion sickness A82-29865
- MOTION SICKNESS DRUGS**
- Efficacy of kavinton in prevention of motion sickness A82-28961
- MOTIVATION**
- Dynamics of a stabilized motor defensive conditioned reflex for different levels of motivation in irradiated rats A82-40464
- Adaptive motivation theory [AD-A111195] A82-28997
- MUSCLES**
- State of the lactate dehydrogenase reaction in the muscular tissue of irradiated animals A82-38158
- Changes in the microelement content of muscles under denervation A82-38598
- Temperature characteristics of the ouabain-insensitive sodium flux in frog muscles A82-38600
- Gramicidin A-induced conductance of the muscle fiber membrane A82-38605
- The effect of urea and heat on the activity of lactate dehydrogenase and glucose 6-phosphate dehydrogenase A82-38612
- Acridine orange inhibition of the ATPase activity of myosin and its fragments A82-38613
- Reactions of O-18 exchange in the myosin systems of skeletal, cardiac, and smooth muscles A82-38614
- The changes in the concentration of free amino acids in muscles during exercise A82-40314
- The effect of denervation and tendotomy on oxidative phosphorylation in the skeletal muscles of the rabbit and on the resistance of phosphorylation to uncoupling agents A82-40504
- Morphometric analysis of rat muscle fibers following space flight and hypogravity A82-40703
- Na<sup>+</sup>/K<sup>+</sup> dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats A82-40707
- Effect of immobilization on the ATPase activities and Ca-uptake of sarcoplasmic reticulum in different types of muscles A82-40708
- Effect of immobilization of the excitatory parameters of different type skeletal muscle A82-40710
- Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization A82-40742
- Testosterone enhances C-14 2-deoxyglucose uptake by striated muscle --- sex hormones and muscle [NASA-CR-169101] N82-28986
- MUSCULAR FATIGUE**
- The effect of certain characteristics of work motions on the tolerance of hand muscles to static exertions A82-38568
- The conditions attending muscular strain in work involving only a few types of movements A82-38569
- Physiological mechanisms of adaptation of rat skeletal muscles to weightlessness and similar functional requirements A82-40689
- Relationship between muscle Qo2 and fatigue during repeated isokinetic contractions --- respiratory capacities A82-41216
- MUSCULAR FUNCTION**
- Proof of the existence of Ca<sup>2+</sup>-induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles A82-38599
- Current problems concerning the vestibulo-ocular interaction A82-39416
- Respiratory movements of the facial muscles and respiratory resistance A82-40456
- Changes of intracellular rest potential and the length of isolated muscle under different loads A82-40480
- Running in circles --- track radius effects on human running speed A82-40661
- Cardiovascular responses to isometric exercise during simulated zero gravity A82-40662
- Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment A82-40701
- Variability of physiological properties of rat skeletal muscles at different gravity levels A82-40702
- The effects of human growth hormone administration on the functional status of rat atrophied muscle following immobilization A82-40715
- The effect of hypokinesia and hypoxia on the function of muscles A82-40739
- Validation of a new method for studying the effects of vibration on the primate spine A82-40768
- Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle A82-41209
- Relationship between muscle Qo2 and fatigue during repeated isokinetic contractions --- respiratory capacities A82-41216
- A new hypothesis for the mechanism of muscle contraction A82-41334
- Dynamics of the brain electric activity in patients with cerebral insults under the effect of muscle stimulation with sinusoidal modulated currents A82-41477
- Condition of rats connective tissue during long-term hypokinesia and in recovery period N82-28969
- MUSCULAR STRENGTH**
- The effect of inotropic factors on the postexercise characteristics of the heart A82-40451
- Atrophy of rat skeletal muscles in simulated weightlessness A82-40738
- Neuromuscular adaptation in human thenar muscles following strength training and immobilization A82-41213

**MUSCULOSKELETAL SYSTEM**

- The effect of denervation and tendotomy on oxidative phosphorylation in skeletal muscles of the rabbit and the resistance of phosphorylation to uncoupling agents A82-38171
- Proof of the existence of Ca<sup>2+</sup>-induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles A82-38599
- Somatotypology and athletics A82-40486
- X-ray study of loaded skeletal portions in the upper extremities of athletes engaging in karate A82-40490
- Physiological mechanisms of adaptation of rat skeletal muscles to weightlessness and similar functional requirements A82-40689
- Body composition of rats flown aboard Cosmos-1129 A82-40695
- Results of morphological investigations aboard biosatellites Cosmos A82-40697
- Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment A82-40701
- Variability of physiological properties of rat skeletal muscles at different gravity levels A82-40702
- Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness A82-40709
- Effect of immobilization on the nonhistone protein composition in different types of skeletal muscles A82-40711
- Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles A82-40712
- Atrophy of rat skeletal muscles in simulated weightlessness A82-40738
- Results of biosatellite studies of gravity-dependent changes in the musculo-skeletal system of mammals A82-40751
- Adaptation of the rat skeleton to weightlessness and its physiological mechanisms - Results of animal experiments aboard the Cosmos-1129 biosatellite A82-40753
- Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle A82-41209
- Myosatelloocytes and cambial properties of skeletal and muscular tissue A82-41469
- Skeletal abnormalities in rats induced by simulated weightlessness A82-41548
- Effect of high ambient temperature on carbohydrate metabolism in rat liver and skeletal muscles N82-28975
- Anatomy of the spine N82-29871
- MUTAGENS**
- The circadian rhythm of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles A82-40462
- MUTATIONS**
- The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice A82-38556
- MYOCARDIAL INFARCTION**
- Enzymes that detoxify active forms of oxygen and lipoperoxide in experimental ischemia and myocardial infarction A82-38540
- The potential of radionuclide diagnosis of acute myocardial infarction A82-41458
- Functional properties of T-lymphocytes in patients with acute myocardial infarction A82-41459

- Characteristics of night sleep disorders in the case of myocardial infarction according to polygraphic data A82-41491
- An evaluation of the informativeness of EKG parameters in diagnosing a myocardial infarction of the back wall of the left ventricle A82-41493
- A comparison of echo- and kinetocardiographic indicators of the myocardial contractility of the left ventricle in patients suffering from various forms of ischemic heart disease A82-41496
- The rate at which exogenous hydrocortisone is eliminated from peripheral blood flow in patients suffering from an acute myocardial infarction A82-41498
- MYOCARDIUM**
- Study of RNA synthesis rate and DNA content in the myocardium of new-born rats during adaptation to high-altitude hypoxia A82-38537
- Two phases of the inotropic effect of adrenaline - The calcium dependence A82-38549
- Ultrastructural qualitative and quantitative evaluation of cytoplasmatic structures of heart muscle of rats living aboard biosputnik Kosmos 936 A82-40694
- Na<sup>+</sup>/K<sup>+</sup> dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats A82-40707
- The ultrastructure of the myocardium in the restorative period following aorto-coronary shunting in patients with chronic ischemic heart disease A82-41484
- The effect of diethylamine analog of ethmazine on the functional condition of myocardium /Clinical and experimental study/ A82-41488
- Catecholamines and enzymes of their metabolism in rat myocardium after flight aboard the Cosmos-936 biosatellite N82-28966

**N**

- NARCOSIS**
- Possible impairment of respiratory regulation under hyperbaric nitrogen narcosis N82-28964
- NASA PROGRAMS**
- Animal models for simulating weightlessness A82-40749
- NEAR FIELDS**
- Absorption characteristics of prolate spheroidal models exposed to the near fields of electrically small apertures A82-38802
- NECK (ANATOMY)**
- Anatomy of the spine N82-29871
- Clinical examination of spinal injuries N82-29882
- NEGATIVE IONS**
- Subjective response to negative air ion exposure A82-40446
- NERVES**
- The effect of denervation and tendotomy on oxidative phosphorylation in skeletal muscles of the rabbit and the resistance of phosphorylation to uncoupling agents A82-38171
- The microcirculatory bed of the lungs after an effect exerted on the right vagus nerve A82-40497
- Implantable electrical device [NASA-CASE-GSC-12560-1] N82-29863
- NEURITIS**
- Evaluation of vestibular function in flight personnel with chronic diseases during stable remission A82-38179
- The use of electrovacuum therapy in certain diseases of the peripheral nervous system A82-41478



NEUROLOGY

Otoneurological symptoms and syndromes --- Russian book

A82-39286

Implantable electrical device

[NASA-CASE-GSC-12560-1]

N82-29863

NEUROMUSCULAR TRANSMISSION

Current problems concerning the vestibulo-ocular interaction

A82-39416

Neuromuscular adaptation in human thenar muscles following strength training and immobilization

A82-41213

NEURONS

Ultrastructural changes in the brains of rats subjected to acute emotional stress

A82-38558

Ion currents through a neuron membrane during the injection of cyclic nucleotides

A82-38588

Neurons in cat visual cortex tuned to the direction of motion in depth - Effect of positional disparity

A82-39434

Spatial organization of the vestibular influences on the cerebellar fastigial neurons of cats

A82-40312

Changes in neurons of the spinal cord and spinal ganglia under hypokinesia /neuromorphological and histochemical investigation/

A82-40494

NEUROPHYSIOLOGY

The impulse activity of neurons in the nodose ganglion during acute hemodynamic and respiratory disorders

A82-38546

A method of evaluating the functional state of the central nervous system of a person performing work

A82-38579

Spatial organization of the vestibular influences on the cerebellar fastigial neurons of cats

A82-40312

Central nervous dysfunctions after near-miss accidents in diving

A82-40443

The correlations of the central nervous system and thyroid functions in conditions of chronic emotional stress

A82-40453

Statistical analysis of neuronal impulse activity in the diencephalon during immobilization-produced emotional stress in rats

A82-40467

Changes in neurons of the spinal cord and spinal ganglia under hypokinesia /neuromorphological and histochemical investigation/

A82-40494

Age changes in the cerebral cortex of humans and cats /A comparative electron-microscopical investigation/

A82-40496

Higher integrative systems of the brain --- Russian book

A82-40642

Neurochemical mechanisms of learning and memory --- Russian book

A82-40646

Optimizing conditions for athletic activity with an allowance made for neurodynamic peculiarities /using bicycle sports as a model/

A82-41503

Phase analysis of dynamics of galvanic skin responses in man

N82-29861

Neurochemical background and approaches in the understanding of motion sickness

[NASA-CR-3569]

N82-29865

NEUROSES

The tolerance to physical loads in women during menopause complicated by climacteric neurosis with cardialgia

A82-41495

NEUROSPORA

Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of Neurospora crassa

A82-38698

NEUTRON IRRADIATION

Neutron radiation dosimetry in high altitude flight personnel

A82-40444

NITRILES

The radiolysis of aqueous propionitrile - Compounds of interest to chemical evolution studies

A82-41197

NITROGEN COMPOUNDS

Nitrogen compound levels in tissues of rat cerebral hemispheres and cerebellum after flight aboard Cosmos-1129 biosatellite

N82-28967

NITROGEN METABOLISM

Nitrogen compound levels in tissues of rat cerebral hemispheres and cerebellum after flight aboard Cosmos-1129 biosatellite

N82-28967

NITROUS OXIDES

Possible impairment of respiratory regulation under hyperbaric nitrogen narcosis

N82-28964

NOISE INJURIES

Pathomorphological investigation of the mechanism of cochlear damage caused by noise

A82-39241

NOISE INTENSITY

Histochemical changes in experimental animals exposed to variable noise

A82-38577

Alterations of histochemical organization in the organ of Corti under the influence of chronic noise

A82-39242

NOISE SPECTRA

Attributing macroscopic fluctuations in aqueous solutions of proteins and other substances to the class of flicker noise

A82-38592

NOISE TOLERANCE

Achievements and possibilities in the research being carried out to protect workers in the 11th five-year plan from noise and vibration

A82-38573

The combined effect of carbon monoxide and total-body vibration on the organism

A82-40475

Tritium oxide distribution and excretion kinetics in the exposure of animals to noise

A82-41463

The incorporation of P-32 into various sections of the brain upon exposure to intermittent noise of \* low intensity

A82-41467

NONLINEAR SYSTEMS

A design methodology for nonlinear systems containing parameter uncertainty: Application to nonlinear controller design [NASA-CR-166358]

N82-29005

NONUNIFORM MAGNETIC FIELDS

The influence of a constant magnetic field on the epileptogenic foci in the hippocampus of rabbits

A82-40466

NUCLEAR MAGNETIC RESONANCE

The temperature dependence of the H-1 NMR spectrum of hydrated collagen

A82-38611

NUCLEIC ACIDS

Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats

A82-40723

NUCLEOTIDES

Ambiguity and the evolution of the genetic code

A82-38120

The concentration of adenyl nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress

A82-38560

Ion currents through a neuron membrane during the injection of cyclic nucleotides

A82-38588

Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of Neurospora crassa

A82-38698

- Ligation of oligonucleotides by pyrimidine dimers  
- A missing 'link' in the origin of life  
A82-39423
- The content of cAMP and cGMP in brain tissues  
during adaptation to ischemia  
A82-40310
- Molecular basis for the genetic code  
A82-41195
- MUTATION**  
Initiation of mutation in sunflower hypocotyls  
A82-40724
- NUTRITION**  
The influence of a deficit of vitamins on immunity  
/A review of the literature/  
A82-41504
- Evaluation of engineering foods for Controlled  
Ecological Life Support Systems (CELSS)  
[NASA-CR-166359]  
A82-29006
- NUTRITIONAL REQUIREMENTS**  
Energy requirements of workers at an oil field in  
western Siberia  
A82-40481
- The role of nutrition in the changes of energy  
metabolism during stress  
A82-40482
- Physical activity and human requirements for  
energy and food substances  
A82-40487
- USSR report. Space biology and aerospace  
medicine, volume 16, no. 3, May - June 1982  
[JPBS-81197]  
A82-28949
- Metabolic distinctions related to intake of  
low-calorie 'survival' rations consisting only  
of readily assimilated carbohydrates  
A82-28953
- NYSTAGMUS**  
Nystagmometry of optovestibular interaction  
A82-28962
- A procedure for the analysis of nystagmus and  
other eye movements  
[AD-A112603]  
A82-28987
- O**
- OBSERVABILITY (SYSTEMS)**  
On the observability of electrical cardiac sources  
--- Thesis  
A82-41450
- OCEAN THERMAL ENERGY CONVERSION**  
OTEC biofouling, corrosion, and materials study  
from a moored platform at Punta Tuna, Puerto Rico  
[DE82-007037]  
A82-28947
- Technical assessment of the prevention of  
micro-fouling on OTEC heat-transfer surfaces  
through the use of ultraviolet radiation  
[DE82-005489]  
A82-29850
- OTEC-1 power system test program: Biofouling and  
corrosion monitoring on OTEC-1  
[DE82-007035]  
A82-29851
- OCTANES**  
An investigation of the conformational stability  
of immunoglobulin G in the monolayers at the  
phase boundary between aqueous solutions of NaCl  
and octane  
A82-38607
- OCULOMOTOR NERVES**  
The cholinergic nature of hypothalamo-cortical  
excitatory influence  
A82-38551
- OFFSHORE PLATFORMS**  
OTEC-1 power system test program: Biofouling and  
corrosion monitoring on OTEC-1  
[DE82-007035]  
A82-29851
- OIL FIELDS**  
Energy requirements of workers at an oil field in  
western Siberia  
A82-40481
- OPERATOR PERFORMANCE**  
Physiological and hygienic analysis of the  
response of young truck drivers to their work load  
A82-38567
- OPERATORS (PERSONNEL)**  
Some characteristics of the diurnal rhythm of  
physiological functions of sailors in the tropics  
A82-38180
- The detection of premonitory states and  
cardiovascular diseases during medical  
examinations of seamen  
A82-38553
- Achievements and possibilities in the research  
being carried out to protect workers in the 11th  
five-year plan from noise and vibration  
A82-38573
- Setting hygienic standards to be applied to  
environmental standards pertaining to the  
rolling stock of railroads and subway systems  
A82-38578
- OPTICAL MEASUREMENT**  
Determination of blood-lipoprotein dimensions by  
optical methods  
A82-38593
- ORAL HYGIENE**  
Acoustic tooth cleaner  
[NASA-CASE-LAR-12471-1]  
A82-29862
- ORGANISMS**  
Systemic mechanisms of homeostasis  
A82-39417
- ORGANIZING**  
The organizing of conferences  
[PB82-142696]  
A82-28948
- ORTHOSTATIC TOLERANCE**  
Baroreflex regulation of hemodynamics under  
orthostatic effects /an investigation with a  
mathematical model/  
A82-38162
- Orthostatic tests during cosmonaut selection  
A82-38854
- Changes in blood volume and response to  
vaso-active drugs in horizontally caged primates  
A82-40657
- A new rat model for studies of hypokinesia and  
antiorthostasis  
A82-40706
- Orthostatic tolerance and exercise response before  
and after 7 days simulated weightlessness  
A82-40731
- Postural control related to the different tilting  
body positions  
A82-40732
- Analysis of transient cardiovascular response to  
orthostatic stress using noninvasive methods  
A82-40740
- Antiorthostatic hypokinesia and circulation in the  
rat  
A82-40741
- Suspension restraint - Induced hypokinesia and  
antiorthostasis as a simulation of weightlessness  
A82-40744
- Regulation of cerebral circulation in erect position  
A82-28957
- OSTEOPOROSIS**  
Skeletal abnormalities in rats induced by  
simulated weightlessness  
A82-41548
- Osteoporosis in unsupported extremities  
A82-28970
- OTOLOGY**  
Otoneurological symptoms and syndromes --- Russian  
book  
A82-39286
- OXIDATION**  
The effect of denervation and tendotomy on  
oxidative phosphorylation in skeletal muscles of  
the rabbit and the resistance of phosphorylation  
to uncoupling agents  
A82-38171
- Chemical evolution. XL - Clay-mediated oxidation  
of diaminomaleonitrile  
A82-41196
- OXYGEN CONSUMPTION**  
Circadian changes in resting heart rate and body  
temperature, maximal oxygen consumption and  
perceived exertion  
A82-38268
- The flavin-dependent consumption of oxygen in  
mitochondria under illumination  
A82-38589
- Metabolic and cardiovascular adaptations in  
trained hypophysectomized rats  
A82-41215
- OXYGEN MASKS**  
The accuracy of venturi masks at altitude  
A82-40445
- OXYGEN METABOLISM**  
Reactions of O-18 exchange in the myosin systems  
of skeletal, cardiac, and smooth muscles  
A82-38614

- The participation of the lymphatic system in the resistance of an organism to hypoxia A82-39793
- Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles A82-40712
- Relationship between muscle  $Q_{O_2}$  and fatigue during repeated isokinetic contractions --- respiratory capacities A82-41216
- Effects of low-intensity electromagnetic fields on human and animal erythrocytes N82-28974
- Intracutaneous partial oxygen pressure ( $p_{O_2}$  sub ic) in man during short-term space flights: Results of joint USSA-GDR space flight N82-30278
- OXYGEN PRODUCTION**  
Determination of maximal aerobic power during upper body exercise [AD-A111712] N82-29866
- OXYGEN TENSION**  
Effects of high-G on ventilation/perfusion in the domestic fowl A82-40672
- OXYGEN 18**  
Reactions of O-18 exchange in the myosin systems of skeletal, cardiac, and smooth muscles A82-38614
- OXYGENATION**  
Prevention of heart function abnormalities during reoxygenation after ischemia by adaptation to altitude hypoxia A82-40455
- OZONE**  
Modification of method for assaying ozone by the diacetyl dihydrolutidine reaction N82-28973
- OZONOMETRY**  
Modification of method for assaying ozone by the diacetyl dihydrolutidine reaction N82-28973
- P**
- P-3 AIRCRAFT**  
Potential applications of computer-assisted instruction to P-3 aircrew training [AD-A113491] N82-29893
- PAIN**  
Functional condition of the heart mitochondria in the dynamics of emotional and pain stress A82-41500
- PAIN SENSITIVITY**  
The role of central gray matter in the activation of antipain systems of the rat's brain under stress A82-38547
- PARABOLIC FLIGHT**  
Rapid perceptual adaptation to high gravito-inertial force levels Evidence for context-specific adaptation A82-40436
- PARACHUTE DESCENT**  
Parachuting N82-29878
- PARACHUTING INJURY**  
Theories of the pathogenesis of fractures of the spine N82-29874
- Ejection of pilots from combat aircraft N82-29877
- Parachuting N82-29878
- PARTICLE SIZE DISTRIBUTION**  
A measurement of the size distribution of lipoproteins in the plasma of human blood A82-38603
- PASSENGER AIRCRAFT**  
The nature and rate of occurrence of medical emergencies on board Air France aircraft A82-38841
- Psychological investigation of pilot behavior during integration of control systems in the cockpit of passenger airliners --- German thesis A82-40560
- PASSENGERS**  
Setting hygienic standards to be applied to environmental standards pertaining to the rolling stock of railroads and subway systems A82-38578
- PATHOGENESIS**  
The detection of premorbid states and cardiovascular diseases during medical examinations of seamen A82-38553
- Pathomorphological investigation of the mechanism of cochlear damage caused by noise A82-39241
- Echocardiographic characterization of heart hypertension A82-40307
- The toxic properties of rabbit and dog sera under controlled hyperthermia A82-40458
- Application of laser therapy to patients with osteoarthritis deformans A82-41475
- Aetiology and pathogenesis --- traumatic lesions of the spine N82-29875
- PATHOLOGICAL EFFECTS**  
Morphological and functional factors contributing to a hypertonic heart A82-38557
- Delayed effects of the internal irradiation of endocrine system in female rats A82-38582
- PATIENTS**  
Diagnosis and organization of the therapy of patients with disorders of blood circulation in the brain A82-38554
- The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones A82-38563
- Intrahemispherical relations of EEG slow-wave components in patients with local brain lesions A82-40472
- The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension A82-40477
- PELVIS**  
The response of the venous walls in the extremities to a disturbed venous outflow A82-40493
- PEPTIDES**  
Abiogenic synthesis of the peptide bond. II A82-39426
- Abiogenic synthesis of the peptide bond. I A82-39448
- The effect of leu-enkephalin and tyrosine on the lymphatic and blood microvessels A82-41490
- USSR report. Life sciences biomedical and behavioral sciences, no. 16 [JPRS-80789] N82-28977
- Monograph on new direction of chemistry and biology of peptide and protein bioregulators reviewed N82-28979
- PERFORMANCE PREDICTION**  
Robotics: Problems and prospects A82-40473
- PERFORMANCE TESTS**  
The accuracy of venturi masks at altitude A82-40445
- PERIPHERAL CIRCULATION**  
An improved apparatus for venous occlusion plethysmography A82-38548
- The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity A82-40763
- The rate at which exogenous hydrocortisone is eliminated from peripheral blood flow in patients suffering from an acute myocardial infarction A82-41498

## PERIPHERAL NERVOUS SYSTEM

Early reaction of the hemopoietic organs depending on the condition of the peripheral M-cholinergic systems

A82-38168

The use of electrovacuum therapy in certain diseases of the peripheral nervous system

A82-41478

## PERIPHERAL VISION

Color vision in the peripheral retina under photopic conditions

A82-38798

Global visual processing for saccadic eye movements

A82-39435

## PERMEABILITY

Optimization of medicinal electrophoresis --- enhancement of cutaneous penetration

A82-41472

## PERSONNEL DEVELOPMENT

Training of personnel specialized in cartography

N82-29669

## PERSONNEL SELECTION

The clinical selection of astronauts at the C.P.E.M.P.N

A82-38852

Vestibular screening of cosmonauts

A82-38853

Orthostatic tests during cosmonaut selection

A82-38854

Selection and training of European astronauts

A82-39507

A test for the prediction of risk-taking attitude in operators

A82-40449

## PERSPIRATION

The effectiveness of perspiration in a hot environment

A82-38178

In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys

A82-41214

## PH FACTOR

Domestic swine in physiological research. 3: Blood gas and acid-base values of arterial and venous blood from young anesthetized pigs maintained under steady-state ventilatory conditions

[AD-A111834] N82-28945

## PHARMACOLOGY

An attempt at the classification of 'patient pharmacokinetic capacities'

A82-38562

Gramicidin A-induced conductance of the muscle fiber membrane

A82-38605

The effect of denervation and tendotomy on oxidative phosphorylation in the skeletal muscles of the rabbit and on the resistance of phosphorylation to uncoupling agents

A82-40504

The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity

A82-40763

Cardiovascular effects of Clonidine during 20 hours head down tilt /-5 deg/

A82-40764

The ultrastructure of the myocardium in the restorative period following aorto-coronary shunting in patients with chronic ischemic heart disease

A82-41484

## PHASE SHIFT

Hyperacuity for luminance phase angle in the human visual system

A82-38799

## PHOSPHATES

Formation of cyanate and carbamyl phosphate by electric discharges of model primitive gas

A82-38116

## PHOSPHORUS METABOLISM

The concentration of adenylyl nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress

A82-38560

## PHOSPHORUS 32

The incorporation of P-32 into various sections of the brain upon exposure to intermittent noise of low intensity

A82-41467

## PHOSPHORYLATION

The effect of denervation and tendotomy on oxidative phosphorylation in skeletal muscles of the rabbit and the resistance of phosphorylation to uncoupling agents

A82-38171

A comparison between the protonophoric and separating functions of weak dibasic acids --- in mitochondrial respiration

A82-38590

The effect of denervation and tendotomy on oxidative phosphorylation in the skeletal muscles of the rabbit and on the resistance of phosphorylation to uncoupling agents

A82-40504

## PHOTOCHEMICAL REACTIONS

The flavin-dependent consumption of oxygen in mitochondria under illumination

A82-38589

## PHOTOSYNTHESIS

Light curves for photosynthesis under intermittent illumination

A82-38608

Orientation and energy-transfer studies on chlorophyll in the photosynthetic membrane [DE82-010180]

N82-29852

## PHYSICAL EXAMINATIONS

The detection of premorbid states and cardiovascular diseases during medical examinations of seamen

A82-38553

The clinical selection of astronauts at the C.P.E.M.P.N

A82-38852

## PHYSICAL EXERCISE

Diagnostics of disturbances of heart rhythm and conductance and their professional evaluation in flight personnel

A82-40309

The changes in the concentration of free amino acids in muscles during exercise

A82-40314

The effect of inotropic factors on the postexercise characteristics of the heart

A82-40451

The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension

A82-40477

Physical activity and human requirements for energy and food substances

A82-40487

X-ray study of loaded skeletal portions in the upper extremities of athletes engaging in karate

A82-40490

Cardiovascular responses to isometric exercise during simulated zero gravity

A82-40662

Effect of athletic training on physical fitness under hypodynamics

A82-40663

Effect of physical training in cool and hot environments on +Gz acceleration tolerance in women

A82-40664

Aspects of cardiovascular adaptation to gravitational stresses

A82-40687

Orthostatic tolerance and exercise response before and after 7 days simulated weightlessness

A82-40731

Response of rat body composition to simultaneous exercise and centrifugation at 3.14g

A82-40766

Neuromuscular adaptation in human thenar muscles following strength training and immobilization

A82-41213

In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys

A82-41214

Relationship between muscle Qo2 and fatigue during repeated isokinetic contractions --- respiratory capacities

A82-41216

Effect of induced erythrocythemia on hypoxia tolerance during physical exercise

A82-41218

# SUBJECT INDEX

# PHYSIOLOGICAL EFFECTS

- Acid-base, metabolic, and ventilatory responses to repeated bouts of exercise A82-41219
- The amplitude of the R wave and the contractile function of the left ventricle in patients with ischemic heart disease A82-41486
- Output and efficiency of the heart in young athletes as a function of the type of athletic training A82-41497
- Physiological studies of heat stress acclimation during a specific exercise regimen [AD-A111897] N82-28991
- Acclimatization to dry heat: Active men versus active women [AD-A111708] N82-28993
- PHYSICAL FITNESS**
- Effect of athletic training on physical fitness under hypodynamics A82-40663
- Problems in the metrology of the training load of ski racers A82-41502
- The speed of blood flow in athletes subjected to the combined action of a training regime and high-altitude climatic factors A82-41505
- Task analysis and the ability requirements of tasks: Collected papers [AD-A11181] N82-29000
- The spine and fitness for flight N82-29889
- Ankylosing spondylitis N82-29891
- PHYSICAL WORK**
- The effect of certain characteristics of work motions on the tolerance of hand muscles to static exertions A82-38568
- The conditions attending muscular strain in work involving only a few types of movements A82-38569
- Energy requirements of workers at an oil field in western Siberia A82-40481
- Diurnal dynamics of the indicators of the capacity for physical work and of physiological functions A82-41460
- The tolerance to physical loads in women during menopause complicated by climacteric neurosis with cardialgia A82-41495
- Slow waves of cardiac rhythm in healthy man under different conditions N82-28955
- PHYSICIANS**
- Medical emergencies on board an airliner - Procedures when a doctor is on board A82-38844
- PHYSIOCHEMISTRY**
- A factor of resistance to emotional stress in the brain of rats A82-40452
- The anti-stress role of the gamma-aminobutyric acid system of the brain A82-40468
- Increasing the efficiency of running on the basis of learning algorithms and information tools A82-40488
- Biochemical aspects of the mechanism by which cholinolytics affect the brain A82-41468
- The use of biochemical monitoring methods in the ergometry of patients with atherosclerosis A82-41494
- PHYSIOLOGICAL ACCELERATION**
- Proceedings of a Meeting of the IUPS Commission on Gravitational Physiology --- Book A82-40649
- Study of high-g effects in animals A82-40651
- The effect of G sub z acceleration on pulmonary perfusion in the miniature swine A82-40681
- International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980, Proceedings A82-40686
- Physiological mechanisms of adaptation of rat skeletal muscles to weightlessness and similar functional requirements A82-40689
- Artificial gravity in space flight A82-40691
- Variability of physiological properties of rat skeletal muscles at different gravity levels A82-40702
- Morphometric analysis of rat muscle fibers following space flight and hypogravity A82-40703
- Gravitational adaptation of animals A82-40716
- Restraint of animals in space research A82-40748
- Effect of sustained Gz acceleration on lung fluid balance - An ultrastructural study A82-40761
- PHYSIOLOGICAL DEFENSES**
- Experimental and clinical study of a new immunoregulatory preparation - thymalin A82-38177
- The role of central gray matter in the activation of antipain systems of the rat's brain under stress A82-38547
- The participation of the lymphatic system in the resistance of an organism to hypoxia A82-39793
- Factors of the natural resistance of the body and methods for studying them A82-40308
- A factor of resistance to emotional stress in the brain of rats A82-40452
- Dynamics of a stabilized motor defensive conditioned reflex for different levels of motivation in irradiated rats A82-40464
- Weightlessness effects on resistance and reactivity of animals A82-40690
- Effect of spaceflight on lymphocyte stimulation A82-40700
- PHYSIOLOGICAL EFFECTS**
- The effect of helium on gas exchange and tissue respiration A82-38165
- Causes of high-altitude acute pulmonary edema A82-38167
- The effect of hypokinesia on the resistance of the heart to hypoxia A82-38170
- Some characteristics of the diurnal rhythm of physiological functions of sailors in the tropics A82-38180
- The influence of the GABA-receptor blocker bicuculline on the effects of fenibut and diazepam A82-38539
- Local cerebral blood flow dynamics during experimental ischemia A82-38544
- Alterations in heart work rhythm during hyperactivation of the anterior amygdaline nucleus A82-38545
- Ultrastructural changes in the brains of rats subjected to acute emotional stress A82-38558
- Achievements and possibilities in the research being carried out to protect workers in the 11th five-year plan from noise and vibration A82-38573
- Histoencyzmological changes in experimental animals exposed to variable noise A82-38577
- Proof of the existence of Ca<sup>2+</sup>/induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles A82-38599
- Pathomorphological investigation of the mechanism of cochlear damage caused by noise A82-39241
- Alterations of histochemical organization in the organ of Corti under the influence of chronic noise A82-39242

# PHYSIOLOGICAL FACTORS

# SUBJECT INDEX

Alterations in the labyrinth receptors after laser irradiation as detected by electron microscopy A82-39244

Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting A82-40442

The influence of a constant magnetic field on the epileptogenic foci in the hippocampus of rabbits A82-40466

Statistical analysis of neuronal impulse activity in the diencephalon during immobilization-produced emotional stress in rats A82-40467

The combined effect of carbon monoxide and total-body vibration on the organism A82-40475

The cause of high-altitude acute pulmonary edema A82-40498

Low-G simulation in mammalian research A82-40654

A new rat model simulating some aspects of space flight A82-40655

Effect of postural changes on minute ventilation, functional residual capacity and pulmonary N2 clearance A82-40660

Effect of athletic training on physical fitness under hypodynamics A82-40663

Effect of physical training in cool and hot environments on +Gz acceleration tolerance in women A82-40664

Bone growth and composition in weanling and mature rats exposed to chronic centrifugation A82-40669

Influences of horizontal hypokinesia on performance and circadian physiological rhythms in female humans A82-40682

Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites A82-40688

Body composition of rats flown aboard Cosmos-1129 A82-40695

Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129 A82-40698

Bone resorption and calcium absorption in rats during spaceflight A82-40704

Bone growth in the rat mandible during space flight A82-40705

Space flight effects upon plasma and tissue lipids in rats A82-40722

Changes of periodic protoplasmic movements on the fast clinostat A82-40725

Skin temperature and thermal comfort in weightlessness A82-40726

Relation between physiological effects of gravitational forces and that of magnetic forces A82-40730

The reaction of simulated and true weightlessness on digestive tract of rats A82-40733

Evidence for arrested bone formation during spaceflight A82-40767

Validation of a new method for studying the effects of vibration on the primate spine A82-40768

Chronic acceleration and brain density A82-40769

Relation between physiological effects of gravitational forces and that of magnetic forces. II A82-40771

Altitude-induced changes in plasma thyroxine, 3,5,3 prime-triiodothyronine, and thyrotropin in rats A82-41207

Neuromuscular adaptation in human thenar muscles following strength training and immobilization A82-41213

The effect of diethylamine analog of ethmazine on the functional condition of myocardium /Clinical and experimental study/ A82-41488

The effect of leienkephalin and thyrosine on the lymphatic and blood microvessels A82-41490

Skeletal abnormalities in rats induced by simulated weightlessness A82-41548

Endurance of +Gz G forces by middle-aged people before and after 7-day immersion N82-28958

Effect of high ambient temperature on carbohydrate metabolism in rat liver and skeletal muscles N82-28975

Biomedical research publications: 1980 - 1982 [NASA-CR-3587] N82-29848

Electrometric investigation of human gustatory analyzer under normal conditions and in simulated weightlessness N82-29859

Phase analysis of dynamics of galvanic skin responses in man N82-29861

Alcohol-induced physiological displacements and their effects on flight related functions [AD-A114919] N82-29867

**PHYSIOLOGICAL FACTORS**

Diurnal dynamics of the indicators of the capacity for physical work and of physiological functions A82-41460

Telemetry methods for monitoring physiological parameters A82-41551

Parachuting N82-29878

**PHYSIOLOGICAL RESPONSES**

Early reaction of the hemopoietic organs depending on the condition of the peripheral M-cholinergic systems A82-38168

Physiological and hygienic analysis of the response of young truck drivers to their work load A82-38567

Field sensitivity of the 'red' mechanism derived from primate local electroretinogram A82-39431

Approaches to the study of the hypothalamus-pituitary gland relationship A82-39569

The physiological mechanisms of the arousal response in animals under conditions of hypobiosis A82-40311

The changes in the concentration of free amino acids in muscles during exercise A82-40314

Antimotion-sickness efficacy of scopolamine 12 and 72 hours after transdermal administration A82-40437

Task categorization and the limits of human performance in extreme heat A82-40439

Thermoregulation and the menstrual cycle A82-40441

The effect of hyperactivation of the anterior amygdaloid nucleus on heart activity during states of altered reactivity A82-40454

Characteristics of human auditory evoked potentials during the lateralization of a 'moving' auditory image A82-40465

The anti-stress role of the gamma-aminobutyric acid system of the brain A82-40468

The effect of the electrical stimulation of afferent pathways on neurons in septal slices A82-40469

Participation of the prefrontal cortex in delayed spatial choice and differentiation of time intervals in rhesus monkeys A82-40470

# SUBJECT INDEX

# PILOT TRAINING

- Age changes in the cerebral cortex of humans and cats /A comparative electron-microscopical investigation/ A82-40496
- The early reaction of the hemopoietic organs to stress, depending on the condition of the peripheral N-cholinergic systems A82-40499
- The effect of products erythrocyte destruction on immunological processes A82-40500
- Computer simulations of postural change, water immersion and bedrest - An integrative approach for understanding the spaceflight response A82-40659
- Receptors signaling gravity orientation in an insect A82-40668
- Effects of high-G on ventilation/perfusion in the domestic fowl A82-40672
- A new rat model for studies of hypokinesia and antiorthostasis A82-40706
- Effect of immobilization of the excitatory parameters of different type skeletal muscle A82-40710
- Alterations in heat loss and heat production mechanisms in rat exposed to hypergravic fields A82-40718
- Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration A82-40720
- International Union of Physiological Sciences, Annual Meeting, 3rd, Innsbruck, Austria, September 29-October 2, 1981, Proceedings A82-40734
- Analysis of transient cardiovascular response to orthostatic stress using noninvasive methods A82-40740
- Suspension restraint - Induced hypokinesia and antiorthostasis as a simulation of weightlessness A82-40744
- Results of investigations of weightlessness effects during prolonged manned space flights onboard Salyut-6 A82-40750
- Mechanisms of the effects of weightlessness on the motor system of man A82-40752
- Cardiac and cerebral vascular adaptation to gravitational stresses in man A82-40765
- Response of rat body composition to simultaneous exercise and centrifugation at 3.14g A82-40766
- Temperature and behavioral responses of squirrel monkeys to 2Gz acceleration A82-40774
- Ventilatory and heart rate responses to hypoxia and hypercapnia during sleep in adults A82-41206
- Application of laser therapy to patients with osteoarthritis deformans A82-41475
- Immunological reactions to lipoproteins and heparin in young men with a hereditary tendency to atherosclerosis A82-41487
- The use of biochemical monitoring methods in the ergometry of patients with atherosclerosis A82-41494
- PHYSIOLOGICAL TESTS**
- Morphological and functional factors contributing to a hypertonic heart A82-38557
- The effect of certain characteristics of work motions on the tolerance of hand muscles to static exertions A82-38568
- Detection/discrimination in the long-wavelength pathways --- human color vision tests A82-39439
- The gradualness of the reaction of the pituitary-adrenocortical system to activating and inhibiting signals A82-40315
- Trace reactions of the frog tissue metabolism on changes of ambient temperature in the frog Rana ridibunda Pall A82-40316
- Central nervous dysfunctions after near-miss accidents in diving A82-40443
- Diurnal changes in the duration of the S and G2 phases of the mitotic cycle in mononuclear and binuclear hepatocytes of normal and thyroxine-treated rats A82-40459
- An LED system for the formation of visual stimuli A82-40471
- The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension A82-40477
- The effect of denervation and tendotomy on oxidative phosphorylation in the skeletal muscles of the rabbit and on the resistance of phosphorylation to uncoupling agents A82-40504
- Antiorthostatic hypokinesia and circulation in the rat A82-40741
- Restraint of animals in space research A82-40748
- Animal models for simulating weightlessness A82-40749
- The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity A82-40763
- PHYSIOLOGY**
- Histamine in biochemistry and physiology --- Russian book A82-39290
- Domestic swine in physiological research. 3: Blood gas and acid-base values of arterial and venous blood from young anesthetized pigs maintained under steady-state ventilatory conditions [AD-A111834] N82-28945
- USSR report. Life sciences. Biomedical and behavioral sciences, no. 18 [JPRS-81428] N82-29857
- Physiopathology and pathology of spinal injuries in aerospace medicine [AGARD-AG-250 (ENG)] N82-29870
- PIGMENTS**
- The flavin-dependent consumption of oxygen in mitochondria under illumination A82-38589
- PILOT PERFORMANCE**
- Physiological stresses in flying a sailplane A82-38850
- Experimentally determined pilot models using hovering VTOL flight data [AIAA PAPER 82-1294] A82-40277
- Aging and visual function of military pilots - A review A82-40435
- Psychological investigation of pilot behavior during integration of control systems in the cockpit of passenger airliners --- German thesis A82-40560
- The effect of G sub z acceleration on pulmonary perfusion in the miniature swine A82-40681
- Human factor and flight safety A82-40885
- Problem of accelerations in aviation medicine N82-28950
- Vibration and assessment of this flight factor by pilots N82-28976
- Quantification of pilot workload via instrument scan [NASA-CR-169238] N82-29900
- PILOT SELECTION**
- Evaluation of vestibular function in flight personnel with chronic diseases during stable remission A82-38179
- PILOT TRAINING**
- Vibration and assessment of this flight factor by pilots N82-28976



# PILOTS (PERSONNEL)

## PILOTS (PERSONNEL)

Alcohol-induced physiological displacements and their effects on flight related functions  
[AD-A114919] N82-29867

## PIPETTES

Microelectronic electrode probe for testing brain electrical activity N82-28982

## PITUITARY GLAND

Approaches to the study of the hypothalamus-pituitary gland relationship A82-39569

The gradualness of the reaction of the pituitary-adrenocortical system to activating and inhibiting signals A82-40315

## PITUITARY HORMONES

The effects of human growth hormone administration on the functional status of rat atrophied muscle following immobilization A82-40715

Metabolic and cardiovascular adaptations in trained hypophysectomized rats A82-41215

## PLANETARY ENVIRONMENTS

Mechanical chemical and bio-hazards --- space-probe related planet and earth contaminations A82-39159

## PLANNING

The organizing of conferences [PB82-142696] N82-28948

## PLANT ROOTS

Root cell gravireaction - Hormone interaction A82-40745

## PLANT STRESS

Research opportunities and limitations of protracted hypogravity simulations for plant gravitational physiology A82-40653

Morphogenesis of a higher plant from cultured cells and embryos in space A82-40666

Gravity sensing, polar transport and cytoplasmic streaming in plant cells A82-40667

Gravity perception and asymmetric growth in plants - A model derived from the grass pulvinus A82-40775

## PLANTS (BOTANY)

Initiation of nutation in sunflower hypocotyls A82-40724

The effect of gravity on the distribution of plant growth substances in plant tissues A82-40746

## PLETHYSMOGRAPHY

An improved apparatus for venous occlusion plethysmography A82-38548

## POLAR REGIONS

Use of the thermovision method in the prophylactic examination of polar workers A82-38565

The assimilation of vitamin C in seamen during voyages at high latitudes A82-41465

## POLARIZED LIGHT

A possible explanation for the fluctuations in reflectivity exhibited by bilayer lipid membranes excited during electrostriction A82-38602

## POLAROGRAPHY

Intracutaneous partial oxygen pressure (pO2 sub ic) in man during short-term space flights: Results of joint USSR-GDR space flight N82-30278

## POLLUTION MONITORING

USSR report. Life sciences. Biomedical and behavioral sciences, no. 17 [JPRS-81419] N82-29853

## POLYMER CHEMISTRY

Thermodynamic parameters characterizing interaction between polymer-absorbed ligand molecules A82-38609

# SUBJECT INDEX

## POLYNUCLEOTIDES

Polynucleotide replication coupled to protein synthesis A possible mechanism for the origin of life A82-38119

## POLYPEPTIDES

Polynucleotide replication coupled to protein synthesis A possible mechanism for the origin of life A82-38119

Evolution of early mechanisms of translation of genetic information into polypeptides A82-41324

## PORTABLE EQUIPMENT

A respirator for training in conditions of changeable respiratory mixture A82-40485

## POSITION (LOCATION)

Neurons in cat visual cortex tuned to the direction of motion in depth - Effect of positional disparity A82-39434

Retinal location and visual localization during pursuit eye movement A82-39436

Orienting and exploratory behavior of gray rat in open field. Zoopsychological analysis N82-28981

## POSTFLIGHT ANALYSIS

Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129 A82-40737

## POSTURE

Effect of postural changes on minute ventilation, functional residual capacity and pulmonary N2 clearance A82-40660

Postural control related to the different tilting body positions A82-40732

## POTASSIUM

ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation A82-40479

Chronic central vascular expansion induces hypokalemia in conscious primates A82-40719

Osteoporosis in unsupported extremities N82-28970

## POTASSIUM CHLORIDES

The effect of hyperactivation of the anterior amygdaloid nucleus on heart activity during states of altered reactivity A82-40454

## PRECIPITATION (CHEMISTRY)

The effect of monovalent cations on the ATPase activity and superprecipitation of actomyosin A82-38615

## PRESSURE EFFECTS

Baroreflex regulation of hemodynamics under orthostatic effects /an investigation with a mathematical model/ A82-38162

## PRESSURIZED CABINS

Modification of method for assaying ozone by the diacetyl dihydrolutidine reaction N82-28973

## PRIMATES

Validation of a new method for studying the effects of vibration on the primate spine A82-40768

## PRIMITIVE EARTH ATMOSPHERE

Formation of cyanate and carbamyl phosphate by electric discharges of model primitive gas A82-38116

## PROCEDURES

Medical emergencies on board an airliner - Procedures when a doctor is on board A82-38844

Medical emergencies on board airliners - Procedures in the absence of a doctor A82-38845

## PROGRAMMERS

Human/computer transaction tasks: An annotated bibliography [AD-A114800] N82-29902

**PROGRAMMING LANGUAGES**

Rule-based programming for human-computer interface specification  
[AD-A113036] N82-29007

**PROLATE SPHEROIDS**

Absorption characteristics of prolate spheroidal models exposed to the near fields of electrically small apertures  
A82-38802

**PROLONGATION**

Problem of accelerations in aviation medicine  
N82-28950

**PROPHYLAXIS**

Use of the thermovision method in the prophylactic examination of polar workers  
A82-38565

**PROSTAGLANDINS**

Prostaglandins and regulation of cerebral circulation under conditions of the altered gaseous composition of the blood  
A82-38561

**PROSTHETIC DEVICES**

Systemic mechanisms of homeostasis  
A82-39417

**PROTECTION**

Theoretical and practical aspects of using acoustic repellants to scare birds. Part 1: Interspecificity and geographic (regional) distinctions of acoustic repellants  
N82-29858

**PROTECTIVE CLOTHING**

Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments  
A82-40440

**PROTEIN METABOLISM**

Acridine orange inhibition of the ATPase activity of myosin and its fragments  
A82-38613

Reactions of O-18 exchange in the myosin systems of skeletal, cardiac, and smooth muscles  
A82-38614

The effect of monovalent cations on the ATPase activity and superprecipitation of actomyosin  
A82-38615

Neurochemical mechanisms of learning and memory --- Russian book  
A82-40646

Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat  
A82-40699

Effect of immobilization on the nonhistone protein composition in different types of skeletal muscles  
A82-40711

Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats  
A82-40723

Leucine and urea metabolism in acute human cold exposure  
A82-41211

**PROTEIN SYNTHESIS**

Clay and the origin of life  
A82-38115

Polynucleotide replication coupled to protein synthesis A possible mechanism for the origin of life  
A82-38119

The effect of laser radiation on lipid synthesis in yeast  
A82-38585

Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of *Neurospora crassa*  
A82-38698

Abiogenic synthesis of the peptide bond. II  
A82-39426

Abiogenic synthesis of the peptide bond. I  
A82-39448

Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization  
A82-40742

Molecular basis for the genetic code  
A82-41195

**PROTEINS**

Attributing macroscopic fluctuations in aqueous solutions of proteins and other substances to the class of flicker noise  
A82-38592

Specificity of action of monovalent cations on the ATPase activity of myosin HMM-S-1  
A82-38594

Proof of the existence of Ca<sup>2+</sup>-induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles  
A82-38599

Conformational dynamics of proteins and simplest molecular 'machines'  
A82-38610

F-actin is a helix with a random variable twist  
A82-38694

Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment  
A82-40701

Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness  
A82-40709

A new hypothesis for the mechanism of muscle contraction  
A82-41334

USSR report. Life sciences biomedical and behavioral sciences, no. 16  
N82-28977

[JPRS-80789]  
Monograph on new direction of chemistry and biology of peptide and protein bioregulators reviewed  
N82-28979

**PROTOBIOLOGY**

Ambiguity and the evolution of the genetic code  
A82-38120

Chemical evolution and the origin of life - Bibliography Supplement 1980  
A82-38122

**PROTON IRRADIATION**

The radiolysis and racemization of leucine on proton irradiation  
A82-38118

**PSEUDOMONAS**

Metabolism of the thermophilic hydrogenous bacterium *Pseudomonas thermophila* K-2  
A82-39427

**PSYCHOACOUSTICS**

An absolute threshold in psychoacoustics  
A82-40448

**PSYCHOLOGICAL EFFECTS**

Subjective response to negative air ion exposure  
A82-40446

Biomedical research publications: 1980 - 1982 [NASA-CR-3587]  
A82-29848

**PSYCHOLOGICAL FACTORS**

Dynamics of subjective discomfort in motion sickness as measured with a magnitude estimation method  
A82-40438

Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting  
A82-40442

Certain psychological and tactical aspects of athlete activities during competitions  
A82-41506

**PSYCHOLOGICAL TESTS**

Effects of reference lines on displacement thresholds at various durations of movement --- in human visual perception  
A82-38797

Effect of chromatic adaptation on the achromatic locus - The role of contrast, luminance and background color  
A82-39433

Gravity and the tilt aftereffect --- comparison between monocular, binocular and interocular exposures  
A82-39440

A test for the prediction of risk-taking attitude in operators  
A82-40449

**PSYCHOLOGY**

Adaptive motivation theory [AD-A111195]  
N82-28997

## PSYCHOMETRICS

A test for the prediction of risk-taking attitude in operators

A82-40449

Adapting a scale for measuring competition anxiety

A82-40450

## PSYCHOPHYSIOLOGY

Circadian changes in resting heart rate and body temperature, maximal oxygen consumption and perceived exertion

A82-38268

The correlations of the central nervous system and thyroid functions in conditions of chronic emotional stress

A82-40453

An LED system for the formation of visual stimuli

A82-40471

Psychic stress in athletic activity

A82-40489

Higher integrative systems of the brain --- Russian book

A82-40642

Neurochemical mechanisms of learning and memory --- Russian book

A82-40646

## PSYCHOSOMATICS

Vegetative reactions to the administration of atropine and propranolol in rats that exhibit different types of behavior

A82-40463

The influence of psychological and somatic factors on the symptomatology of hypertension

A82-41492

The tolerance to physical loads in women during menopause complicated by climacteric neurosis with cardialgia

A82-41495

## PUBLIC HEALTH

Setting hygienic standards to be applied to environmental standards pertaining to the rolling stock of railroads and subway systems

A82-38578

## PULMONARY CIRCULATION

The microcirculatory bed of the lungs after an effect exerted on the right vagus nerve

A82-40497

The effect of G sub z acceleration on pulmonary perfusion in the miniature swine

A82-40681

Effect of sustained Gz acceleration on lung fluid balance - An ultrastructural study

A82-40761

## PULMONARY FUNCTIONS

Causes of high-altitude acute pulmonary edema

A82-38167

The cause of high-altitude acute pulmonary edema

A82-40498

Effect of postural changes on minute ventilation, functional residual capacity and pulmonary N2 clearance

A82-40660

Effects of high-G on ventilation/perfusion in the domestic fowl

A82-40672

Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration

A82-40720

Pulmonary stretch receptor discharge patterns in eupnea, hypercapnia, and hypoxia

A82-41210

A nonlinear model combining pulmonary mechanics and gas concentration dynamics

A82-41230

## PULSE GENERATORS

Thermal pulsation - Techniques, demonstration, and clinical application

A82-41474

## PURSUIT TRACKING

Retinal location and visual localization during pursuit eye movement

A82-39436

## PYRIMIDINES

Changes in the relations of pyrimidine blocks in DNA of the hematopoietic system immediately following gamma irradiation of the animal

A82-38152

Ligation of oligonucleotides by pyrimidine dimers - A missing 'link' in the origin of life

A82-39423

## Q

## QUARTZ LAMPS

Detection/discrimination in the long-wavelength pathways --- human color vision tests

A82-39439

## R

## RADIATION ABSORPTION

Absorption characteristics of prolate spheroidal models exposed to the near fields of electrically small apertures

A82-38802

## RADIATION DAMAGE

Radiation damage and recovery of mouse T-cells. IV - Elimination of radiation-induced migration abnormalities in T-lymphocytes

A82-38156

Effects of cAMP accumulation activators on certain stages of genome expression in cells upon acute radiation damage to the organism. III Comparative study of the properties of RNA synthesized in a system of isolated liver and spleen cell nuclei from irradiated rats and animals having been treated with serotonin prior to irradiation

A82-38157

The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice

A82-38556

## RADIATION DOSAGE

Equivalent doses, dose rates and times of chronic exposure to ionizing radiation for various mammals

A82-38160

Setting safety standards for ionizing radiation

A82-38580

Neutron radiation dosimetry in high altitude flight personnel

A82-40444

Dynamics of a stabilized motor defensive conditioned reflex for different levels of motivation in irradiated rats

A82-40464

A hygienic evaluation of the biological effects of nonionizing microwave radiation

A82-41464

What is ALARA

[DE81-030814]

N82-28995

Cytogenetic analysis of peripheral blood lymphocytes of individuals exposed to low doses of ionizing radiation

N82-29856

## RADIATION EFFECTS

The radiolysis and racemization of leucine on proton irradiation

A82-38118

Changes in electrically neutral Ca<sup>2+</sup>/H<sup>+</sup> exchange in rat liver mitochondria following gamma irradiation

A82-38151

Changes in the relations of pyrimidine blocks in DNA of the hematopoietic system immediately following gamma irradiation of the animal

A82-38152

Radiation-induced shortening of the life span of D. melanogaster. II - Sensitizing effects of 5-bromo-2-deoxyuridine

A82-38155

State of the lactate dehydrogenase reaction in the muscular tissue of irradiated animals

A82-38158

Effect of the combined administration of antibiotic-resistant bifidobacteria and the corresponding antibiotics on the survival of irradiated mice

A82-38581

Delayed effects of the internal irradiation of endocrine system in female rats

A82-38582

The effect of laser radiation on lipid synthesis in yeast

A82-38585

Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions

A82-38586

# SUBJECT INDEX

# RECEPTORS (PHYSIOLOGY)

- The mechanism of the microwave effect on the conductivity of bilayer lipid membranes  
A82-38587
- ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation  
A82-40479
- The intracellular responses of frog eggs to novel orientations to gravity  
A82-40758
- Hygienic evaluation of an 8-mm-wave electromagnetic field  
A82-41462
- A hygienic evaluation of the biological effects of nonionizing microwave radiation  
A82-41464
- Long-term and progressive changes in Rhesus spectral sensitivity after low-level coherent light (514nm exposure) --- effects of laser exposure on visual function  
[AD-A111639] N82-28946
- RADIATION PROTECTION**  
Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats  
A82-38159
- What is ALARA  
[DE81-030814] N82-28995
- Attenuation of radioprotective effects of acute hypoxia on animals adapted to high altitudes  
N82-29855
- RADIATION SICKNESS**  
Tritium oxide distribution and excretion kinetics in the exposure of animals to noise  
A82-41463
- RADIATION THERAPY**  
Application of laser therapy to patients with osteoarthritis deformans  
A82-41475
- RADIATION TOLERANCE**  
Study of the relation between the number of sulfhydryl groups and the level of lipid antioxidant activity in the organs of individual animals of different species  
A82-38153
- RADIOACTIVE ISOTOPES**  
The potential of radionuclide diagnosis of acute myocardial infarction  
A82-41458
- RADIOBIOLOGY**  
Optimization of the conditions of modified cell irradiation  
A82-38154
- Radiation-induced shortening of the life span of *D. melanogaster*. II - Sensitizing effects of 5-bromo-2-deoxyuridine  
A82-38155
- Effects of cAMP accumulation activators on certain stages of genome expression in cells upon acute radiation damage to the organism. III  
Comparative study of the properties of RNA synthesized in a system of isolated liver and spleen cell nuclei from irradiated rats and animals having been treated with serotonin prior to irradiation  
A82-38157
- Equivalent doses, dose rates and times of chronic exposure to ionizing radiation for various mammals  
A82-38160
- Delayed effects of the internal irradiation of endocrine system in female rats  
A82-38582
- Absorption characteristics of prolate spheroidal models exposed to the near fields of electrically small apertures  
A82-38802
- Long-term and progressive changes in Rhesus spectral sensitivity after low-level coherent light (514nm exposure) --- effects of laser exposure on visual function  
[AD-A111639] N82-28946
- USSR report. Life sciences. Biomedical and behavioral sciences, no. 17  
[JPRS-81419] N82-29853
- USSR report. Life sciences. Biomedical and behavioral sciences, no. 18  
[JPRS-81428] N82-29857
- RADIOGRAPHY**  
Effects of lower body negative pressure on the reliability of cardiovascular system using X-ray kymographs  
A82-40728
- Analytical study of traumatic lesions of C3-C7  
N82-29884
- Radiological study of fractures of C1 and C2  
N82-29885
- RADIOLOGY**  
The potential of radionuclide diagnosis of acute myocardial infarction  
A82-41458
- Radiology of spinal trauma in aviation medicine  
N82-29883
- RADIOLYSIS**  
The radiolysis and racemization of leucine on proton irradiation  
A82-38118
- The radiolysis of aqueous propionitrile - Compounds of interest to chemical evolution studies  
A82-41197
- RADIOPATHOLOGY**  
Effect of the combined administration of antibiotic-resistant bifidobacteria and the corresponding antibiotics on the survival of irradiated mice  
A82-38581
- RAIL TRANSPORTATION**  
Setting hygienic standards to be applied to environmental standards pertaining to the rolling stock of railroads and subway systems  
A82-38578
- RANKING**  
The ranking of displays based on transinformation --- as a measure of tracking performance  
[FB-52] N82-29001
- RAPID TRANSIT SYSTEMS**  
Setting hygienic standards to be applied to environmental standards pertaining to the rolling stock of railroads and subway systems  
A82-38578
- RATS**  
Adaptation of the rat skeleton to weightlessness and its physiological mechanisms - Results of animal experiments aboard the Cosmos-1129 biosatellite  
A82-40753
- Mitotic activity and volume of epithelial cell nuclei of rat cornea following spaceflights in biosatellites  
N82-28965
- Catecholamines and enzymes of their metabolism in rat myocardium after flight aboard the Cosmos-936 biosatellite  
N82-28966
- Nitrogen compound levels in tissues of rat cerebral hemispheres and cerebellum after flight aboard Cosmos-1129 biosatellite  
N82-28967
- REACTION TIME**  
Rapid perceptual adaptation to high gravito-inertial force levels Evidence for context-specific adaptation  
A82-40436
- Participation of the prefrontal cortex in delayed spatial choice and differentiation of time intervals in rhesus monkeys  
A82-40470
- RECEPTORS (PHYSIOLOGY)**  
Early reaction of the hemopoietic organs depending on the condition of the peripheral M-cholinergic systems  
A82-38168
- The influence of the GABA-receptor blocker bicuculline on the effects of fenibut and diazepam  
A82-38539
- Alterations of histochemical organization in the organ of Corti under the influence of chronic noise  
A82-39242
- Alterations in the labyrinth receptors after laser irradiation as detected by electron microscopy  
A82-39244
- Pulmonary stretch receptor discharge patterns in eupnea, hypercapnia, and hypoxia  
A82-41210

## RECTUM

Electrical stimulation of the urinary bladder following radical surgery for cancer of the rectum  
A82-41479

## REDUCED GRAVITY

Lockheed involvement in Shuttle life sciences flight experiments  
A82-39541

Research opportunities and limitations of protracted hypogravity simulations for plant gravitational physiology  
A82-40653

Low-G simulation in mammalian research  
A82-40654

Human lymphocyte activation is depressed at low-g and enhanced at high-g  
A82-40658

Cardiovascular responses to isometric exercise during simulated zero gravity  
A82-40662

Morphometric analysis of rat muscle fibers following space flight and hypogravity  
A82-40703

Relation between physiological effects of gravitational forces and that of magnetic forces  
A82-40730

Relation between physiological effects of gravitational forces and that of magnetic forces. II  
A82-40771

Response of cultured cells to hyper- and hypogravity  
A82-40773

## REFLECTANCE

A possible explanation for the fluctuations in reflectivity exhibited by bilayer lipid membranes excited during electrostriction  
A82-38602

## REFLEXES

The protective role of the forebrain with respect to pathological cardiac reflexes  
A82-38543

Current problems concerning the vestibulo-ocular interaction  
A82-39416

Electrometric investigation of human gustatory analyzer under normal conditions and in simulated weightlessness  
N82-29859

Significance of minute volume parameters to evaluation of vestibular stability  
N82-29860

## REFUELING

An industrial hygiene evaluation of aircraft refueling inside closed aircraft shelters at elevated ambient temperatures  
[AD-A114396]  
N82-28994

## REGENERATION (ENGINEERING)

Preprototype independent air revitalization subsystem  
[NASA-CR-167703]  
N82-29898

## REGENERATION (PHYSIOLOGY)

Implantable electrical device  
[NASA-CASE-GSC-12560-1]  
N82-29863

## REMOTE SENSORS

Image orientation for RPV ground station crew  
A82-39743

## REMOTELY PILOTED VEHICLES

Image orientation for RPV ground station crew  
A82-39743

Human factors of an RPV ground control station  
A82-39749

## RENAL FUNCTION

The diagnostic value of phonocenterography in acute renal failure  
A82-40478

Reduction in renal artery blood flow impedance during upright tilt in man  
A82-40735

Relevance of aldosterone on circulatory, renal and blood reactions during simulated weightlessness and on aerobic metabolic rate  
A82-40736

## RESEARCH AND DEVELOPMENT

Robotics: Problems and prospects  
A82-40473

## RESISTANCE

Occult bacterial persistence and resistance to colonization after antibiotic therapy  
A82-40460

## RESPIRATION

The effect of helium on gas exchange and tissue respiration  
A82-38165

A nonlinear model combining pulmonary mechanics and gas concentration dynamics  
A82-41230

Human external respiration and gas exchange in acute period of adaptation to immersion in water  
N82-28959

## RESPIRATORS

A respirator for training in conditions of changeable respiratory mixture  
A82-40485

## RESPIRATORY DISEASES

The impulse activity of neurons in the nodose ganglion during acute hemodynamic and respiratory disorders  
A82-38546

The use of hyperoxic mixtures for the diagnosis of latent disturbances in the external respiration system  
A82-40457

## RESPIRATORY IMPEDANCE

Respiratory movements of the facial muscles and respiratory resistance  
A82-40456

## RESPIRATORY PHYSIOLOGY

The thermal pulsation method in the study of several physiological mechanisms of the brain stem  
A82-38559

The cause of high-altitude acute pulmonary edema  
A82-40498

Effect of postural changes on minute ventilation, functional residual capacity and pulmonary  $\dot{V}_E$  clearance  
A82-40660

Pulmonary stretch receptor discharge patterns in eupnea, hypercapnia, and hypoxia  
A82-41210

## RESPIRATORY RATE

Relations between respiratory and circulatory control during gravitational load in man  
A82-40714

Ventilatory and heart rate responses to hypoxia and hypercapnia during sleep in adults  
A82-41206

Possible impairment of respiratory regulation under hyperbaric nitrogen narcosis  
N82-28964

Significance of minute volume parameters to evaluation of vestibular stability  
N82-29860

## RESPIRATORY REFLEXES

Respiratory movements of the facial muscles and respiratory resistance  
A82-40456

## REST

Circadian changes in resting heart rate and body temperature, maximal oxygen consumption and perceived exertion  
A82-38268

## RETICULOCYTES

Methodological aspects of testing erythrocyte balance by counting incubated reticulocytes  
N82-28972

## RHEUMATIC DISEASES

Ankylosing spondylitis  
N82-29891

Medico-legal aspect of spinal disorders in aviation medicine  
N82-29892

## RIBONUCLEIC ACIDS

Polynucleotide replication coupled to protein synthesis: A possible mechanism for the origin of life  
A82-38119

Effects of cAMP accumulation activators on certain stages of genome expression in cells upon acute radiation damage to the organism. III  
Comparative study of the properties of RNA synthesized in a system of isolated liver and spleen cell nuclei from irradiated rats and animals having been treated with serotonin prior to irradiation  
A82-38157

- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-38169
- RNA-content distribution of cells from the normal and atherosclerotic human aorta A82-38535
- Study of RNA synthesis rate and DNA content in the myocardium of new-born rats during adaptation to high-altitude hypoxia A82-38537
- The dynamics of quantitative changes of RNA in rat cerebellum Purkinje cells in different functional states A82-38538
- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis A82-40501
- Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization A82-40742
- Molecular basis for the genetic code A82-41195
- RISK**  
A test for the prediction of risk-taking attitude in operators A82-40449
- ROBOTS**  
Robotics: Problems and prospects A82-40473
- Control of a direct-drive arm [AD-A114969] N82-29903
- ROCKET PROPELLED SLEDS**  
Accidents in centrifugas and experiments (ejection seat training towers, sleds) N82-29881
- RUNNING**  
Increasing the efficiency of running on the basis of learning algorithms and information tools A82-40488
- Running in circles --- track radius effects on human running speed A82-40661
- S**
- SACCADIC EYE MOVEMENTS**  
Global visual processing for saccadic eye movements A82-39435
- SAFETY FACTORS**  
Setting safety standards for ionizing radiation A82-38580
- SALYUT SPACE STATION**  
Initial audiometric investigations in an orbital station N82-30277
- SAWTOOTH WAVEFORMS**  
Temporal sensitivities to square-wave gratings, sawtooth-wave gratings and their fundamentals - More evidence for multiple spatial frequency channels in human vision A82-39437
- SCALE EFFECT**  
Gravitational scale effects --- moving organism performance as function of gravity and size A82-40650
- SCANNERS**  
Quantification of pilot workload via instrument scan [NASA-CR-169238] N82-29900
- SCHEDULES**  
Rotating shift work schedules that disrupt sleep are improved by applying circadian principles A82-38325
- SCHEDULING**  
Aircraft and crew scheduling during airlift operations [AD-A114114] N82-29011
- SEA WATER**  
Technical assessment of the prevention of micro-fouling on OTEC heat-transfer surfaces through the use of ultraviolet radiation [DE82-005489] N82-29850
- OTEC-1 power system test program: Biofouling and corrosion monitoring on OTEC-1 [DE82-007035] N82-29851

- SEATS**  
Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting A82-40442
- SEGMENTS**  
Segmentation and analysis of stereophotometric body surface data [AD-A114916] N82-29868
- SENSORIMOTOR PERFORMANCE**  
The cortical regulation of human motion --- Russian book A82-39283
- Rapid perceptual adaptation to high gravito-inertial force levels Evidence for context-specific adaptation A82-40436
- State of adaptation in patients with hypertension A82-40476
- Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129 A82-40737
- Mechanisms of the effects of weightlessness on the motor system of man A82-40752
- SENSORY DEPRIVATION**  
Labyrinth plugging as a model of suspended vestibular sensory input A82-40721
- SENSORY PERCEPTION**  
Vibration and assessment of this flight factor by pilots N82-28976
- SENSORY STIMULATION**  
Vegetative reactions to the administration of atropine and propranolol in rats that exhibit different types of behavior A82-40463
- SEROTONIN**  
Effects of cAMP accumulation activators on certain stages of genome expression in cells upon acute radiation damage to the organism. III Comparative study of the properties of RNA synthesized in a system of isolated liver and spleen cell nuclei from irradiated rats and animals having been treated with serotonin prior to irradiation A82-38157
- The effect of serotonin on the development of acute hyperthermia in rats A82-38583
- Serotonin content of peripheral organs and tissues in rats under normal conditions and under stress during postnatal development A82-38584
- ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation A82-40479
- SERUMS**  
The participation of the lymphatic system in the resistance of an organism to hypoxia A82-39793
- The toxic properties of rabbit and dog sera under controlled hyperthermia A82-40458
- SEX**  
Testosterone enhances C-14 2-deoxyglucose uptake by striated muscle --- sex hormones and muscle [NASA-CR-169101] N82-28986
- SHEEP**  
The biological effects of repeated blasts [AD-A113113] N82-28990
- SHELTERS**  
An industrial hygiene evaluation of aircraft refueling inside closed aircraft shelters at elevated ambient temperatures [AD-A114396] N82-28994
- SHIELDING**  
What is ALARA [DE81-030814] N82-28995
- SICKNESSES**  
The nature and rate of occurrence of medical emergencies on board Air France aircraft A82-38841
- Medical emergencies in flight - Pathogenic aspects A82-38843

# SIGNS AND SYMPTOMS

# SUBJECT INDEX

## SIGNS AND SYMPTOMS

The detection of premonitory states and cardiovascular diseases during medical examinations of seamen

A82-38553

Otoneurological symptoms and syndromes --- Russian book

A82-39286

## SINE WAVES

Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating

A82-38795

## SITTING POSITION

Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting

A82-40442

Postural control related to the different tilting body positions

A82-40732

## SIZE DETERMINATION

Determination of blood-lipoprotein dimensions by optical methods

A82-38593

## SKIN (ANATOMY)

The histochemistry of enzymes in specific skin glands of the European hedgehog /Erinaceus europaeus/ during hibernation

A82-39792

Ultrasonic determination of thermodynamic threshold parameters for irreversible cutaneous burns

A82-41122

## SKIN RESISTANCE

Optimization of medicinal electrophoresis --- enhancement of cutaneous penetration

A82-41472

## SKIN TEMPERATURE (BIOLOGY)

Use of the thermovision method in the prophylactic examination of polar workers

A82-38565

Skin temperature and thermal comfort in weightlessness

A82-40726

Thermal pulsation - Techniques, demonstration, and clinical application

A82-41474

## SLEEP

Rotating shift work schedules that disrupt sleep are improved by applying circadian principles

A82-38325

The thermal pulsation method in the study of several physiological mechanisms of the brain stem

A82-38559

Ventilatory and heart rate responses to hypoxia and hypercapnia during sleep in adults

A82-41206

Sleep, circadian cycles of physiological functions and parameters of human work capacity on first day after changing from altered to usual sleep-waking cycle

N82-28951

## SLEEP DEPRIVATION

Characteristics of night sleep disorders in the case of myocardial infarction according to polygraphic data

A82-41491

## SOCIAL FACTORS

From a man-machine system to a social-engineering system

A82-40447

Natural and social determination of human psyche

N82-28983

## SODIUM

Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions

A82-38586

Temperature characteristics of the ouabain-insensitive sodium flux in frog muscles

A82-38600

## SODIUM CHLORIDES

An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane

A82-38607

## SOLAR COOLING

Superior heat-transfer fluids for solar heating and cooling applications. Results of acute oral toxicity determinations [DE82-003071]

N82-29869

## SOLAR HEATING

Superior heat-transfer fluids for solar heating and cooling applications. Results of acute oral toxicity determinations [DE82-003071]

N82-29869

## SOLAR RADIATION

Synchronization of cardiovascular accidents with physical clocks

N82-28956

## SORPTION

Bone resorption and calcium absorption in rats during spaceflight

A82-40704

## SOUND PROPAGATION

The effect of ultrasound and phonophoresis of ganglioblockers on the cardiovascular system in patients with cervical osteochondrosis

A82-41476

## SOUND WAVES

Theoretical and practical aspects of using acoustic repellants to scare birds. Part 1: Interspecificity and geographic (regional) distinctions of acoustic repellants

N82-29858

## SPACE ENVIRONMENT SIMULATION

Cardiovascular responses of the chronically instrumented monkey during simulated space flight

A82-40670

## SPACE EXPLORATION

Mechanical chemical and bio-hazards --- space-probe related planet and earth contaminations

A82-39159

## SPACE FLIGHT FEEDING

Evaluation of engineering foods for closed Ecological Life Support System (CELSS)

[NASA-CR-167626] N82-29003

Nutrition and food technology for a Controlled Ecological Life Support System (CELSS)

[NASA-CR-167392] N82-29004

Evaluation of engineering foods for Controlled Ecological Life Support Systems (CELSS)

[NASA-CR-166359] N82-29006

## SPACE FLIGHT STRESS

Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations

A82-39429

Low-G simulation in mammalian research

A82-40654

A new rat model simulating some aspects of space flight

A82-40655

Computer simulations of postural change, water immersion and bedrest - An integrative approach for understanding the spaceflight response

A82-40659

Altered bone turnover during spaceflight

A82-40679

Effect of space flight on bone strength

A82-40680

International Union of Physiological Sciences, Annual Meeting, 2nd, Budapest, Hungary, July 13-19, 1980, Proceedings

A82-40686

Aspects of cardiovascular adaptation to gravitational stresses

A82-40687

Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites

A82-40688

Physiological mechanisms of adaptation of rat skeletal muscles to weightlessness and similar functional requirements

A82-40689

Weightlessness effects on resistance and reactivity of animals

A82-40690

Artificial gravity in space flight

A82-40691

Biorhythms of rats during and after space flight

A82-40692



# SUBJECT INDEX

# SPINE

- Stress in space flight - Metabolic aspects  
A82-40696
- Results of morphological investigations aboard biosatellites Cosmos  
A82-40697
- Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat  
A82-40699
- Effect of spaceflight on lymphocyte stimulation  
A82-40700
- Morphometric analysis of rat muscle fibers following space flight and hypogravity  
A82-40703
- Labyrinth plugging as a model of suspended vestibular sensory input  
A82-40721
- Space flight effects upon plasma and tissue lipids in rats  
A82-40722
- Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats  
A82-40723
- The reaction of simulated and true weightlessness on digestive tract of rats  
A82-40733
- Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129  
A82-40737
- Involuntary and voluntary mechanisms for preventing cerebral ischemia due to positive /Gz/ acceleration  
A82-40747
- Results of investigations of weightlessness effects during prolonged manned space flights onboard Salyut-6  
A82-40750
- Results of biosatellite studies of gravity-dependent changes in the musculo-skeletal system of mammals  
A82-40751
- Vestibular effects of water immersion and Clonidine  
A82-40762
- Evidence for arrested bone formation during spaceflight  
A82-40767
- Gravity only dependent receptor field of the vestibular sensors Its significance in orbital flight  
A82-40770
- USSR report. Space biology and aerospace medicine, volume 16, no. 3, May - June 1982 [JPRS-81197]  
A82-28949
- Dynamics of left ventricular systolic phase structure during long-term (140-185 days) spaceflights  
A82-28954
- Biomedical research publications: 1980 - 1982 [NASA-CR-3587]  
A82-29848
- SPACE FLIGHT TRAINING**  
Selection and training of European astronauts  
A82-39507
- SPACE PERCEPTION**  
Hyperacuity for luminance phase angle in the human visual system  
A82-38799
- Neurons in cat visual cortex tuned to the direction of motion in depth - Effect of positional disparity  
A82-39434
- SPACE SHUTTLE PAYLOADS**  
Lockheed involvement in Shuttle life sciences flight experiments  
A82-39541
- SPACEBORNE EXPERIMENTS**  
Lockheed involvement in Shuttle life sciences flight experiments  
A82-39541
- Morphogenesis of a higher plant from cultured cells and embryos in space  
A82-40666
- Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129  
A82-40698
- Bone resorption and calcium absorption in rats during spaceflight  
A82-40704
- Bone growth in the rat mandible during space flight  
A82-40705
- Space flight effects upon plasma and tissue lipids in rats  
A82-40722
- Skin temperature and thermal comfort in weightlessness  
A82-40726
- Results of biosatellite studies of gravity-dependent changes in the musculo-skeletal system of mammals  
A82-40751
- Initial audiometric investigations in an orbital station  
N82-30277
- SPACECRAFT CABIN ATMOSPHERES**  
Preprototype independent air revitalization subsystem [NASA-CR-167703]  
N82-29898
- SPACECRAFT ENVIRONMENTS**  
Methodological aspects of future cardiovascular research in space  
A82-40652
- SPACELAB PAYLOADS**  
Selection and training of European astronauts  
A82-39507
- SPATIAL DISTRIBUTION**  
Cytoarchitectonics of the epidermis and the epidermal proliferative units /EPU/  
A82-40491
- SPATIAL FILTERING**  
Temporal sensitivities to square-wave gratings, sawtooth-wave gratings and their fundamentals - More evidence for multiple spatial frequency channels in human vision  
A82-39437
- SPECTRAL SENSITIVITY**  
Field sensitivity of the 'red' mechanism derived from primate local electroretinogram  
A82-39431
- Discrimination and detection thresholds - The effect of observer criterion on the spatial properties of chromatic and achromatic mechanisms  
A82-39438
- Long-term and progressive changes in Rhesus spectral sensitivity after low-level coherent light (514nm exposure) --- effects of laser exposure on visual function [AD-A111639]  
N82-28946
- SPINAL CORD**  
Changes in neurons of the spinal cord and spinal ganglia under hypokinesia /neuromorphological and histochemical investigation/  
A82-40494
- SPINE**  
Validation of a new method for studying the effects of vibration on the primate spine  
A82-40768
- Physiopathology and pathology of spinal injuries in aerospace medicine [AGARD-AG-250 (ENG)]  
N82-29870
- Anatomy of the spine  
N82-29871
- Biomechanics of the spine  
N82-29872
- Spinal stresses in flight  
N82-29873
- Theories of the pathogenesis of fractures of the spine  
N82-29874
- Aetiology and pathogenesis --- traumatic lesions of the spine  
N82-29875
- Helicopter accidents  
N82-29876
- Parachuting  
N82-29878
- Fractures of the spine in flight  
N82-29880
- Accidents in centrifuges and experiments (ejection seat training towers, sleds)  
N82-29881
- Clinical examination of spinal injuries  
N82-29882
- Radiology of spinal trauma in aviation medicine  
N82-29883

## SQUARE WAVES

## SUBJECT INDEX

Analytical study of traumatic lesions of C3-C7  
N82-29884  
Radiological study of fractures of C1 and C2  
N82-29885  
Sequelae of vertebral fractures and trauma  
N82-29886  
The cervical column of pilots of combat aircraft  
N82-29888  
The spine and fitness for flight  
N82-29889  
Ankylosing spondylitis  
N82-29891  
Medico-legal aspect of spinal disorders in  
aviation medicine  
N82-29892

## SQUARE WAVES

Temporal sensitivities to square-wave gratings,  
sawtooth-wave gratings and their fundamentals -  
More evidence for multiple spatial frequency  
channels in human vision  
A82-39437

## STANDARDS

Setting hygienic standards to be applied to  
environmental standards pertaining to the  
rolling stock of railroads and subway systems  
A82-38578  
Setting safety standards for ionizing radiation  
A82-38580

What is ALARA

[DE81-030814]

N82-28995

Development of a methodology for assessing aircrew  
workloads  
[AD-A114364]  
N82-29010

## STATIC LOADS

The effect of certain characteristics of work  
motions on the tolerance of hand muscles to  
static exertions  
A82-38568

## STATISTICAL ANALYSIS

A model for the origin of life  
A82-41198

## STEREOPHOTOGRAPHY

Segmentation and analysis of stereophotometric  
body surface data  
[AD-A114916]  
N82-29868

## STEREOSCOPIC VISION

Hyperacuity for luminance phase angle in the human  
visual system  
A82-38799

## STERILIZATION

The microflora of the central Antarctica glacier  
and control methods for the sterile isolation of  
an ice core for microbiological analyses  
A82-39430

## STEROIDS

Testosterone enhances C-14 2-deoxyglucose uptake  
by striated muscle --- sex hormones and muscle  
[NASA-CR-169101]  
N82-28986

## STIMULANTS

Temperature characteristics of the  
ouabain-insensitive sodium flux in frog muscles  
A82-38600

## STIMULI

A procedure for the analysis of nystagmus and  
other eye movements  
[AD-A112603]  
N82-28987

## STOCHASTIC PROCESSES

Conformational dynamics of proteins and simplest  
molecular 'machines'  
A82-38610

## STRESS (PHYSIOLOGY)

The characteristics of hemodynamic shifts under  
physical stress at mountain elevations  
A82-38166  
Early reaction of the hemopoietic organs depending  
on the condition of the peripheral M-cholinergic  
systems  
A82-38168

Migration kinetics of hemopoietic stem cells in  
mice after severe mechanical trauma  
A82-38541

The role of central gray matter in the activation  
of antipain systems of the rat's brain under  
stress  
A82-38547

The concentration of adenyl nucleotides and  
creatine phosphate in the cerebral hemispheres  
during different manifestations of stress  
A82-38560

A method of evaluating the functional state of the  
central nervous system of a person performing work  
A82-38579

The effect of serotonin on the development of  
acute hyperthermia in rats  
A82-38583

Serotonin content of peripheral organs and tissues  
in rats under normal conditions and under stress  
during postnatal development  
A82-38584

Physiological stresses linked to flight on airliners  
A82-38842

Physiological stresses in flying a sailplane  
A82-38850

The anti-stress role of the gamma-aminobutyric  
acid system of the brain  
A82-40468

The combined effect of carbon monoxide and  
total-body vibration on the organism  
A82-40475

Changes of intracellular rest potential and the  
length of isolated muscle under different loads  
A82-40480

The role of nutrition in the changes of energy  
metabolism during stress  
A82-40482

Physical activity and human requirements for  
energy and food substances  
A82-40487

X-ray study of loaded skeletal portions in the  
upper extremities of athletes engaging in karate  
A82-40490

The early reaction of the hemopoietic organs to  
stress, depending on the condition of the  
peripheral M-cholinergic systems  
A82-40499

The effect of hypoxic and hypobaric exercises on  
the blood-brain barrier in rats  
A82-40713

Analysis of transient cardiovascular response to  
orthostatic stress using noninvasive methods  
A82-40740

The use of biochemical monitoring methods in the  
ergometry of patients with atherosclerosis  
A82-41494

Functional condition of the heart mitochondria in  
the dynamics of emotional and pain stress  
A82-41500

Role of hormonal compounds in regulation of  
electrolyte metabolism in the presence of  
emotional stress  
N82-28952

Slow waves of cardiac rhythm in healthy man under  
different conditions  
N82-28955

Physiological studies of heat stress acclimation  
during a specific exercise regimen  
[AD-A111897]  
N82-28991

Task analysis and the ability requirements of  
tasks: Collected papers  
[AD-A111181]  
N82-29000

Hypo- and hyperglycemia in rats: Effects on the  
ability to work in the heat  
[AD-A111711]  
N82-29849

Significance of minute volume parameters to  
evaluation of vestibular stability  
N82-29860

Phase analysis of dynamics of galvanic skin  
responses in man  
N82-29861

## STRESS (PSYCHOLOGY)

The effect of repeated episodes of emotional  
stress on heart activity and the content of  
monoamines in the heart  
A82-38163

The influence of the GABA-receptor blocker  
bicuculline on the effects of fenibut and diazepam  
A82-38539

Ultrastructural changes in the brains of rats  
subjected to acute emotional stress  
A82-38558

Adapting a scale for measuring competition anxiety  
A82-40450

A factor of resistance to emotional stress in the  
brain of rats  
A82-40452

# SUBJECT INDEX

# TEMPERATURE EFFECTS

The correlations of the central nervous system and thyroid functions in conditions of chronic emotional stress  
A82-40453

Statistical analysis of neuronal impulse activity in the diencephalon during immobilization-produced emotional stress in rats  
A82-40467

The anti-stress role of the gamma-aminobutyric acid system of the brain  
A82-40468

Psychic stress in athletic activity  
A82-40489

Task analysis and the ability requirements of tasks: Collected papers [AD-A111181]  
N82-29000

**STUDENTS**  
Instructor's role in individualized training: A survey of two computer managed courses [AD-A114917]  
N82-29894

**SUBMERGING**  
Vestibular effects of water immersion and Clonidine  
A82-40762

ADH suppression under immersion combined with dehydration --- antidiuretic hormone secretion  
A82-40776

Endurance of +Gz G forces by middle-aged people before and after 7-day immersion  
N82-28958

Human external respiration and gas exchange in acute period of adaptation to immersion in water  
N82-28959

**SULFUR COMPOUNDS**  
Study of the relation between the number of sulfhydryl groups and the level of lipid antioxidant activity in the organs of individual animals of different species  
A82-38153

**SUPINE POSITION**  
Postural control related to the different tilting body positions  
A82-40732

**SURFACE PROPERTIES**  
An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane  
A82-38607

**SURGERY**  
The effect of denervation and tendotomy on oxidative phosphorylation in skeletal muscles of the rabbit and the resistance of phosphorylation to uncoupling agents  
A82-38171

Sword and scalpel --- laser surgery  
A82-38564

The ultrastructure of the myocardium in the restorative period following aorto-coronary shunting in patients with chronic ischemic heart disease  
A82-41484

**SURVIVAL**  
Effect of the combined administration of antibiotic-resistant bifidobacteria and the corresponding antibiotics on the survival of irradiated mice  
A82-38581

**SURVIVAL EQUIPMENT**  
Metabolic distinctions related to intake of low-calorie 'survival' rations consisting only of readily assimilated carbohydrates  
N82-28953

**SUSPENDING (HANGING)**  
A new rat model simulating some aspects of space flight  
A82-40655

Suspension restraint - Induced hypokinesia and antiorthostasis as a simulation of weightlessness  
A82-40744

Animal models for simulating weightlessness  
A82-40749

**SWIMMING**  
Relation between physiological effects of gravitational forces and that of magnetic forces  
A82-40730

**SWINE**  
The biological effects of repeated blasts [AD-A113113]  
N82-28990

# SYMPTOMOLOGY

The influence of psychological and somatic factors on the symptomatics of hypertension  
A82-41492

# SYNAPSES

Ultrastructural changes in the brains of rats subjected to acute emotional stress  
A82-38558

# SYNTHESIS (CHEMISTRY)

Uracil synthesis via HCN oligomerization --- chemical evolution of biomolecules in primitive earth  
A82-38117

Acceleration of HCN oligomerization by formaldehyde and related compounds - Implications for prebiotic syntheses  
A82-41199

Monograph on new direction of chemistry and biology of peptide and protein bioregulators reviewed  
N82-28979

# SYSTEMS ANALYSIS

An approach to the preliminary evaluation of Closed Ecological Life Support System (CELSS) scenarios and control strategies [NASA-CR-166368]  
N82-29897

# SYSTEMS ENGINEERING

A design methodology for nonlinear systems containing parameter uncertainty: Application to nonlinear controller design [NASA-CR-166358]  
N82-29005

Preprototype independent air revitalization subsystem [NASA-CR-167703]  
N82-29898

# SYSTOLE

Alterations in heart work rhythm during hyperactivation of the anterior amygdaline nucleus  
A82-38545

Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system  
A82-40656

Dynamics of left ventricular systolic phase structure during long-term (140-185 days) spaceflights  
N82-28954

# T

# TACHYCARDIA

The effect of repeated episodes of emotional stress on heart activity and the content of monoamines in the heart  
A82-38163

# TARGET RECOGNITION

Discrimination and detection thresholds - The effect of observer criterion on the spatial properties of chromatic and achromatic mechanisms  
A82-39438

# TASK COMPLEXITY

Task analysis and the ability requirements of tasks: Collected papers [AD-A111181]  
N82-29000

# TASKS

On models and methods for performance measurement [AD-A113578]  
N82-28998

# TASTE

Electrometric investigation of human gustatory analyzer under normal conditions and in simulated weightlessness  
N82-29859

# TEETH

Bone growth in the rat mandible during space flight  
A82-40705

Acoustic tooth cleaner [NASA-CASE-LAR-12471-1]  
N82-29862

# TEMPERATURE DEPENDENCE

Temperature characteristics of the ouabain-insensitive sodium flux in frog muscles  
A82-38600

The temperature dependence of the H-1 NMR spectrum of hydrated collagen  
A82-38611

# TEMPERATURE EFFECTS

The effect of urea and heat on the activity of lactate dehydrogenase and glucose 6-phosphate dehydrogenase  
A82-38612

## TENDONS

Thermal pulsation - Techniques, demonstration, and clinical application

A82-41474

Physiological studies of heat stress acclimation during a specific exercise regimen [AD-A111897]

N82-28991

Phase analysis of dynamics of galvanic skin responses in man

N82-29861

## TENDONS

The effect of denervation and tendotomy on oxidative phosphorylation in skeletal muscles of the rabbit and the resistance of phosphorylation to uncoupling agents

A82-38171

The effect of denervation and tendotomy on oxidative phosphorylation in the skeletal muscles of the rabbit and on the resistance of phosphorylation to uncoupling agents

A82-40504

## THALANUS

Higher integrative systems of the brain --- Russian book

A82-40642

## THERAPY

Diagnosis and organization of the therapy of patients with disorders of blood circulation in the brain

A82-38554

Occult bacterial persistence and resistance to colonization after antibiotic therapy

A82-40460

Optimization of medicinal electrophoresis --- enhancement of cutaneous penetration

A82-41472

The use of an audio-frequency magnetic field in certain diseases

A82-41473

Thermal pulsation - Techniques, demonstration, and clinical application

A82-41474

The effect of ultrasound and phonophoresis of ganglioblockers on the cardiovascular system in patients with cervical osteochondrosis

A82-41476

Dynamics of the brain electric activity in patients with cerebral insults under the effect of muscle stimulation with sinusoidal modulated currents

A82-41477

The use of electrovacuum therapy in certain diseases of the peripheral nervous system

A82-41478

Electrical stimulation of the urinary bladder following radical surgery for cancer of the rectum

A82-41479

## THERMAL ABSORPTION

Effect of heating rate on evaporative heat loss in the microwave-exposed mouse

A82-41208

## THERMAL COMFORT

The effectiveness of perspiration in a hot environment

A82-38178

Skin temperature and thermal comfort in weightlessness

A82-40726

Thermal garment [NASA-CASE-XMS-03694-1]

N82-29002

## THERMAL ENVIRONMENTS

Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments

A82-40440

## THERMAL INSULATION

Thermal garment [NASA-CASE-XMS-03694-1]

N82-29002

## THERMAL MAPPING

Use of the thermovision method in the prophylactic examination of polar workers

A82-38565

## THERMAL POLLUTION

Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria

A82-39422

## SUBJECT INDEX

## THERMAL PROTECTION

Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats

A82-38159

## THERMAL STABILITY

The effect of urea and heat on the activity of lactate dehydrogenase and glucose 6-phosphate dehydrogenase

A82-38612

## THERMALIZATION (ENERGY ABSORPTION)

Thermal pulsation - Techniques, demonstration, and clinical application

A82-41474

## THERMODYNAMIC PROPERTIES

Thermodynamic parameters characterizing interaction between polymer-absorbed ligand molecules

A82-38609

Ultrasonic determination of thermodynamic threshold parameters for irreversible cutaneous burns

A82-41122

## THERMODYNAMICS

Local cerebral blood flow dynamics during experimental ischemia

A82-38544

## THERMOPHILES

Metabolism of the thermophilic hydrogenous bacterium *Pseudomonas thermophila* K-2

A82-39427

## THERMOPHILIC PLANTS

Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria

A82-39422

## THERMOREGULATION

The thermal pulsation method in the study of several physiological mechanisms of the brain stem

A82-38559

The effect of serotonin on the development of acute hyperthermia in rats

A82-38583

Trace reactions of the frog tissue metabolism on changes of ambient temperature in the frog *Rana ridibunda* Pall

A82-40316

Thermoregulation and the menstrual cycle

A82-40441

Centrifuge high-g effects on temperature regulation in unanesthetized rats

A82-40671

Alterations in heat loss and heat production mechanisms in rat exposed to hypergravic fields

A82-40718

Temperature and behavioral responses of squirrel monkeys to 2Gz acceleration

A82-40774

Effect of heating rate on evaporative heat loss in the microwave-exposed mouse

A82-41208

In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys

A82-41214

## THIAMINE

The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones

A82-38563

## THRESHOLDS (PERCEPTION)

Effects of reference lines on displacement thresholds at various durations of movement --- in human visual perception

A82-38797

Application of xylite for the detection of labyrinthine hydrops

A82-39243

Temporal sensitivities to square-wave gratings, sawtooth-wave gratings and their fundamentals - More evidence for multiple spatial frequency channels in human vision

A82-39437

Discrimination and detection thresholds - The effect of observer criterion on the spatial properties of chromatic and achromatic mechanisms

A82-39438

An absolute threshold in psychoacoustics

A82-40448

- Effect of caloric stimulation of vestibular system on hearing N82-28963
- Determining visual acuity thresholds: A simulation study of stimulus presentation strategies [AD-A111821] N82-28992
- THYMUS GLAND**
- Changes in the relations of pyrimidine blocks in DNA of the hematopoietic system immediately following gamma irradiation of the animal A82-38152
- Experimental and clinical study of a new immunoregulatory preparation - thymalin A82-38177
- THYROID GLAND**
- The correlations of the central nervous system and thyroid functions in conditions of chronic emotional stress A82-40453
- THYROXINE**
- Altitude-induced changes in plasma thyroxine, 3,5,3 prime-triiodothyronine, and thyrotropin in rats A82-41207
- The effect of leienkephalin and thyrosine on the lymphatic and blood microvessels A82-41490
- TIBIA**
- Aortic and tibial bloodflow response to lower body negative pressure /LBNP/ A82-40727
- TIME DEPENDENCE**
- Temporal sensitivities to square-wave gratings, sawtooth-wave gratings and their fundamentals - More evidence for multiple spatial frequency channels in human vision A82-39437
- Antimotion-sickness efficacy of scopolamine 12 and 72 hours after transdermal administration A82-40437
- TISSUES (BIOLOGY)**
- The effect of helium on gas exchange and tissue respiration A82-38165
- Histoencyzmological changes in experimental animals exposed to variable noise A82-38577
- Serotonin content of peripheral organs and tissues in rats under normal conditions and under stress during postnatal development A82-38584
- The content of cAMP and cGMP in brain tissues during adaptation to ischemia A82-40310
- Trace reactions of the frog tissue metabolism on changes of ambient temperature in the frog Rana ridibunda Pall A82-40316
- Space flight effects upon plasma and tissue lipids in rats A82-40722
- The assimilation of vitamin C in seamen during voyages at high latitudes A82-41465
- Myosatelloocytes and cambial properties of skeletal and muscular tissue A82-41469
- Nitrogen compound levels in tissues of rat cerebral hemispheres and cerebellum after flight aboard Cosmos-1129 biosatellite N82-28967
- TOXIC HAZARDS**
- An industrial hygiene evaluation of aircraft refueling inside closed aircraft shelters at elevated ambient temperatures [AD-A114396] N82-28994
- TOXICITY**
- The toxic properties of rabbit and dog sera under controlled hyperthermia A82-40458
- Protection from O2 toxicity by preexposure to hypoxia - Lung antioxidant enzyme role A82-41217
- The consequences of hydrazine exposition and its treatment [MBL-1981-2] N82-28996
- TOXICITY AND SAFETY HAZARD**
- Superior heat-transfer fluids for solar heating and cooling applications. Results of acute oral toxicity determinations [DE82-003071] N82-29869
- TRACE ELEMENTS**
- Changes in the microelement content of muscles under denervation A82-38598
- TRAINING ANALYSIS**
- Instructor's role in individualized training: A survey of two computer managed courses [AD-A114917] N82-29894
- TRAINING EVALUATION**
- Training of personnel specialized in cartography N82-29669
- Potential applications of computer-assisted instruction to P-3 aircrew training [AD-A113491] N82-29893
- TRAINING SIMULATORS**
- Unconventional visual displays for flight training [AD-A111392] N82-28999
- TRANSIENT RESPONSE**
- Analysis of transient cardiovascular response to orthostatic stress using noninvasive methods A82-40740
- TRITIUM**
- Tritium oxide distribution and excretion kinetics in the exposure of animals to noise A82-41463
- TROPICAL REGIONS**
- Some characteristics of the diurnal rhythm of physiological functions of sailors in the tropics A82-38180
- U**
- U.S.S.R.**
- USSR report. Life sciences. Biomedical and behavioral sciences, no. 18 [JPRS-81428] N82-29857
- ULTRASONIC CLEANING**
- Acoustic tooth cleaner [NASA-CASE-LAR-12471-1] N82-29862
- ULTRASONIC RADIATION**
- The effect of ultrasound and phonophoresis of ganglioblockers on the cardiovascular system in patients with cervical osteochondrosis A82-41476
- ULTRASONIC TESTS**
- Ultrasonic determination of thermodynamic threshold parameters for irreversible cutaneous burns A82-41122
- ULTRAVIOLET RADIATION**
- The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice A82-38556
- Technical assessment of the prevention of micro-fouling on OTEC heat-transfer surfaces through the use of ultraviolet radiation [DE82-005489] N82-29850
- URACIL**
- Uracil synthesis via HCN oligomerization --- chemical evolution of biomolecules in primitive earth A82-38117
- UREAS**
- The effect of urea and heat on the activity of lactate dehydrogenase and glucose 6-phosphate dehydrogenase A82-38612
- Leucine and urea metabolism in acute human cold exposure A82-41211
- URINATION**
- Electrical stimulation of the urinary bladder following radical surgery for cancer of the rectum A82-41479
- URINE**
- Rhythms of electrolytes and hydroxyproline excretion in urine of rats after three weeks of weightlessness - Biosatellite Cosmos-1129 A82-40693
- USER REQUIREMENTS**
- Development of a methodology for assessing aircrew workloads [AD-A114364] N82-29010

## V

## VACUUM EFFECTS

- The use of electrovacuum therapy in certain diseases of the peripheral nervous system A82-41478

## VAPORS

- An industrial hygiene evaluation of aircraft refueling inside closed aircraft shelters at elevated ambient temperatures [AD-A114396] A82-28994

## VASCULAR SYSTEM

- Chronic central vascular expansion induces hypokalemia in conscious primates A82-40719
- Short term gravity effects on volume homeostasis in man Assessment of transvascular fluid shifts after graded tilt A82-40760

## VASOCONSTRICTION

- An improved apparatus for venous occlusion plethysmography A82-38548

## VASOCONSTRICTOR DRUGS

- Changes in blood volume and response to vaso-active drugs in horizontally caged primates A82-40657

## VEGETATION GROWTH

- Cytogenetic effect of 5-fluoro-2desoxy uridine in the G2 phase on intact and X-irradiated crepis capillaris L cells A82-40461
- Gravitational scale effects --- moving organism performance as function of gravity and size A82-40650

## VEINS

- The response of the venous walls in the extremities to a disturbed venous outflow A82-40493

## VENTILATION

- Acid-base, metabolic, and ventilatory responses to repeated bouts of exercise A82-41219
- Modification of method for assaying ozone by the diacetyl dihydrolutidine reaction A82-28973

## VENTURI TUBES

- The accuracy of venturi masks at altitude A82-40445

## VERTEBRAE

- Peculiarities of the relief of the trabecular surface of the spongy substance of the human vertebrae A82-40492

## VERTEBRAL COLUMN

- Anatomy of the spine A82-29871
- Biomechanics of the spine A82-29872
- Helicopter accidents A82-29876
- Clinical examination of spinal injuries A82-29882
- Vertebral arthritis A82-29890
- Medico-legal aspect of spinal disorders in aviation medicine A82-29892

## VERTEBRATES

- Proof of the existence of Ca<sup>2+</sup>/Mg<sup>2+</sup>-induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles A82-38599

## VERTICAL ORIENTATION

- Regulation of cerebral circulation in erect position A82-28957

## VERTICAL PERCEPTION

- Receptors signaling gravity orientation in an insect A82-40668
- Preparation of labyrinthectomized animals for flight aboard Cosmos-936 biosatellite A82-28971

## VESTIBULAR NYSTAGMUS

- Evaluation of vestibular function in flight personnel with chronic diseases during stable remission A82-38179

Otoneurological symptoms and syndromes --- Russian book A82-39286

Current problems concerning the vestibulo-ocular interaction A82-39416

Nystagmometry of optovestibular interaction A82-28962

## VESTIBULAR TESTS

- Evaluation of vestibular function in flight personnel with chronic diseases during stable remission A82-38179
- The dynamics of quantitative changes of RNA in rat cerebellum Purkinje cells in different functional states A82-38538
- Vestibular screening of cosmonauts A82-38853
- Labyrinth plugging as a model of suspended vestibular sensory input A82-40721
- Vestibular effects of water immersion and Clonidine A82-40762
- Gravity only dependent receptor field of the vestibular sensors Its significance in orbital flight A82-40770
- Effect of caloric stimulation of vestibular system on hearing A82-28963
- A procedure for the analysis of nystagmus and other eye movements [AD-A112603] A82-28987
- Significance of minute volume parameters to evaluation of vestibular stability A82-29860

## VESTIBULES

- Spatial organization of the vestibular influences on the cerebellar fastigial neurons of cats A82-40312
- Afferent associative and commissural projections of the cortical vestibular zone VI of cats A82-40495
- Gravity sensing system formation in tadpoles /Rana temporaria/ developed in weightlessness simulation A82-40759
- Effect of caloric stimulation of vestibular system on hearing A82-28963
- Preparation of labyrinthectomized animals for flight aboard Cosmos-936 biosatellite A82-28971

## VESTS

- Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments A82-40440

## VIBRATION EFFECTS

- Achievements and possibilities in the research being carried out to protect workers in the 11th five-year plan from noise and vibration A82-38573
- The combined effect of carbon monoxide and total-body vibration on the organism A82-40475
- Vibration and decompression gas bubbles A82-40729
- Validation of a new method for studying the effects of vibration on the primate spine A82-40768
- Vibration and assessment of this flight factor by pilots A82-28976

## VIDEO EQUIPMENT

- A functional video-based anthropometric measuring system [NASA-CR-167637] A82-29896

## VINYL COPOLYMERS

- The utilization of macromolecules in blood purification systems [NRC/CNR-TT-2021] A82-29864

## VIRUSES

- The circadian rhythms of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles A82-40462

## VISION

- Long-term and progressive changes in Rhesus spectral sensitivity after low-level coherent light (514nm exposure) --- effects of laser exposure on visual function  
[AD-A11639] N82-28946  
Cold weather goggles. 2: Performance evaluation  
[AD-A114067] N82-29008

## VISUAL ACCOMMODATION

- Model of the accommodative mechanism in the human eye  
A82-39432

## VISUAL ACUITY

- Hyperacuity for luminance phase angle in the human visual system  
A82-38799  
Aging and visual function of military pilots - A review  
A82-40435

- Determining visual acuity thresholds: A simulation study of stimulus presentation strategies  
[AD-A11821] N82-28992

## VISUAL AIDS

- Unconventional visual displays for flight training  
[AD-A11392] N82-28999

## VISUAL DISCRIMINATION

- Discrimination and detection thresholds - The effect of observer criterion on the spatial properties of chromatic and achromatic mechanisms  
A82-39438

- Detection/discrimination in the long-wavelength pathways --- human color vision tests  
A82-39439

- The ranking of displays based on transinformation --- as a measure of tracking performance  
[PB-52] N82-29001

## VISUAL PERCEPTION

- Contrast influence on perceived orientation --- of gratings obtained by dichoptic fusion of two monocular images  
A82-38796

- Retinal location and visual localization during pursuit eye movement  
A82-39436

- Temporal sensitivities to square-wave gratings, sawtooth-wave gratings and their fundamentals - More evidence for multiple spatial frequency channels in human vision  
A82-39437

- Image orientation for RPV ground station crew  
A82-39743

- Mode of mutual influence of stimulation-characteristics in the visual processing system --- German thesis  
A82-41445

- Visual Technology Research Simulator (VTRS) human performance research: Phase 3  
[AD-A112475] N82-28988

- Determining visual acuity thresholds: A simulation study of stimulus presentation strategies  
[AD-A11821] N82-28992

- Cold weather goggles. 2: Performance evaluation  
[AD-A114067] N82-29008

## VISUAL STIMULI

- Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating  
A82-38795

- Contrast influence on perceived orientation --- of gratings obtained by dichoptic fusion of two monocular images  
A82-38796

- Hyperacuity for luminance phase angle in the human visual system  
A82-38799

- Field sensitivity of the 'red' mechanism derived from primate local electroretinogram  
A82-39431

- Effect of chromatic adaptation on the achromatic locus - The role of contrast, luminance and background color  
A82-39433

- Neurons in cat visual cortex tuned to the direction of motion in depth - Effect of positional disparity  
A82-39434

- Global visual processing for saccadic eye movements  
A82-39435

- Retinal location and visual localization during pursuit eye movement  
A82-39436

- Detection/discrimination in the long-wavelength pathways --- human color vision tests  
A82-39439

- An LED system for the formation of visual stimuli  
A82-40471

- Mode of mutual influence of stimulation-characteristics in the visual processing system --- German thesis  
A82-41445

- Determining visual acuity thresholds: A simulation study of stimulus presentation strategies  
[AD-A11821] N82-28992

## VISUAL TASKS

- Global visual processing for saccadic eye movements  
A82-39435

- Participation of the prefrontal cortex in delayed spatial choice and differentiation of time intervals in rhesus monkeys  
A82-40470

## VITAMINS

- The influence of a deficit of vitamins on immunity /A review of the literature/  
A82-41504

## W

## WATER BALANCE

- A new rat model for studies of hypokinesia and antiorthostasis  
A82-40706

## WATER POLLUTION

- Microorganisms used to monitor environmental pollution  
N82-28978

## WAVE GENERATION

- A study of the mechanism governing the different types of behavior exhibited by the spiral excitation wave period in auricle and ventricle  
A82-38597

## WAVELENGTHS

- Detection/discrimination in the long-wavelength pathways --- human color vision tests  
A82-39439

## WEIGHTLESSNESS

- Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations  
A82-39429

- Methodological aspects of future cardiovascular research in space  
A82-40652

- Morphogenesis of a higher plant from cultured cells and embryos in space  
A82-40666

- Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites  
A82-40688

- Physiological mechanisms of adaptation of rat skeletal muscles to weightlessness and similar functional requirements  
A82-40689

- Weightlessness effects on resistance and reactivity of animals  
A82-40690

- Artificial gravity in space flight  
A82-40691

- Rhythms of electrolytes and hydroxyproline excretion in urine of rats after three weeks of weightlessness - Biosatellite Cosmos-1129  
A82-40693

- Body composition of rats flown aboard Cosmos-1129  
A82-40695

- Stress in space flight - Metabolic aspects  
A82-40696

- Results of morphological investigations aboard biosatellites Cosmos  
A82-40697

- Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129  
A82-40698



## WEIGHTLESSNESS SIMULATION

## SUBJECT INDEX

Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat A82-40699

Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment A82-40701

Bone resorption and calcium absorption in rats during spaceflight A82-40704

Bone growth in the rat mandible during space flight A82-40705

Skin temperature and thermal comfort in weightlessness A82-40726

Results of investigations of weightlessness effects during prolonged manned space flights onboard Salyut-6 A82-40750

Results of biosatellite studies of gravity-dependent changes in the musculo-skeletal system of mammals A82-40751

Mechanisms of the effects of weightlessness on the motor system of man A82-40752

Adaptation of the rat skeleton to weightlessness and its physiological mechanisms - Results of animal experiments aboard the Cosmos-1129 biosatellite A82-40753

Suppression of osteoblast differentiation during weightlessness A82-40756

Preparation of labyrinthectomized animals for flight aboard Cosmos-936 biosatellite N82-28971

Methodological aspects of testing erythrocyte balance by counting incubated reticulocytes N82-28972

Neurochemical background and approaches in the understanding of motion sickness [NASA-CR-3569] N82-29865

Medical-biological investigations under space conditions: Present and future significance N82-30275

Intracutaneous partial oxygen pressure (pO<sub>2</sub> sub ic) in man during short-term space flights: Results of joint USSR-GDR space flight N82-30278

**WEIGHTLESSNESS SIMULATION**

Orthostatic tests during cosmonaut selection A82-38854

As if in weightlessness --- simulation through hypnosis A82-40474

Study of high-g effects in animals A82-40651

Research opportunities and limitations of protracted hypogravity simulations for plant gravitational physiology A82-40653

Low-G simulation in mammalian research A82-40654

A new rat model simulating some aspects of space flight A82-40655

Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system A82-40656

Cardiovascular responses to isometric exercise during simulated zero gravity A82-40662

Effect of simulated weightlessness on energy metabolism in the rat A82-40677

Influences of horizontal hypokinesia on performance and circadian physiological rhythms in female humans A82-40682

Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness A82-40709

Chronic central vascular expansion induces hypokalemia in conscious primates A82-40719

Changes of periodic protoplasmic movements on the fast clinostat A82-40725

Orthostatic tolerance and exercise response before and after 7 days simulated weightlessness A82-40731

The reaction of simulated and true weightlessness on digestive tract of rats A82-40733

Relevance of aldosterone on circulatory, renal and blood reactions during simulated weightlessness and on aerobic metabolic rate A82-40736

Atrophy of rat skeletal muscles in simulated weightlessness A82-40738

Effects of prolonged bedrest in antiorthostatic position on rCBF measured by <sup>133</sup>Xe inhalation technique - Effects of clonidine --- regional Cerebral Blood Flow A82-40743

Suspension restraint - Induced hypokinesia and antiorthostasis as a simulation of weightlessness A82-40744

Restraint of animals in space research A82-40748

Animal models for simulating weightlessness A82-40749

Gravity sensing system formation in tadpoles /Rana temporaria/ developed in weightlessness simulation A82-40759

Vestibular effects of water immersion and Clonidine A82-40762

The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity A82-40763

Cardiovascular effects of Clonidine during 20 hours head down tilt /-5 deg/ A82-40764

ADH suppression under immersion combined with dehydration --- antidiuretic hormone secretion A82-40776

Skeletal abnormalities in rats induced by simulated weightlessness A82-41548

Endurance of +Gz G forces by middle-aged people before and after 7-day immersion N82-28958

Efficacy of kavinton in prevention of motion sickness N82-28961

Electrometric investigation of human gustatory analyzer under normal conditions and in simulated weightlessness N82-29859

**WHITE NOISE**

The incorporation of P-32 into various sections of the brain upon exposure to intermittent noise of low intensity A82-41467

**WORK**

Rotating shift work schedules that disrupt sleep are improved by applying circadian principles A82-38325

**WORK CAPACITY**

Some characteristics of the diurnal rhythm of physiological functions of sailors in the tropics A82-38180

A study of temporary absences from work arising from disorders of the circulatory system A82-38555

Achievements and possibilities in the research being carried out to protect workers in the 11th five-year plan from noise and vibration A82-38573

A method of evaluating the functional state of the central nervous system of a person performing work A82-38579

The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension A82-40477

Physical activity and human requirements for energy and food substances A82-40487

Diurnal dynamics of the indicators of the capacity for physical work and of physiological functions A82-41460

- Problem of accelerations in aviation medicine  
N82-28950
- Sleep, circadian cycles of physiological functions  
and parameters of human work capacity on first  
day after changing from altered to usual  
sleep-waking cycle  
N82-28951
- On models and methods for performance measurement  
[AD-A113578] N82-28998
- Flight crewmember workload evaluation  
[AD-A114167] N82-29012
- WORK-REST CYCLE**  
Flight crewmember workload evaluation  
[AD-A114167] N82-29012
- WORKLOADS (PSYCHOPHYSIOLOGY)**  
Use of the thermovision method in the prophylactic  
examination of polar workers  
A82-38565
- Physiological and hygienic analysis of the  
response of young truck drivers to their work load  
A82-38567
- The conditions attending muscular strain in work  
involving only a few types of movements  
A82-38569
- Psychological investigation of pilot behavior  
during integration of control systems in the  
cockpit of passenger airliners --- German thesis  
A82-40560
- The tolerance to physical loads in women during  
menopause complicated by climacteric neurosis  
with cardialgia  
A82-41495
- Development of a methodology for assessing aircrew  
workloads  
[AD-A114364] N82-29010
- Quantification of pilot workload via instrument scan  
[NASA-CR-169238] N82-29900
- WOUND HEALING**  
Relation between physiological effects of  
gravitational forces and that of magnetic forces  
A82-40730

## X

- X RAY ANALYSIS**  
X-ray study of loaded skeletal portions in the  
upper extremities of athletes engaging in karate  
A82-40490
- Effects of lower body negative pressure on the  
reliability of cardiovascular system using X-ray  
kymograms  
A82-40728
- X RAY FLUORESCENCE**  
Changes in the microelement content of muscles  
under denervation  
A82-38598
- X RAY IRRADIATION**  
Cytogenetic effect of 5-fluoro-2desoxy uridine in  
the G2 phase on intact and X-irradiated crepis  
capillaris L cells  
A82-40461
- ATPase activity and the potassium ion permeability  
of erythrocyte membranes in the presence of  
serotonin and radiation  
A82-40479

## Y

- YEAST**  
The effect of laser radiation on lipid synthesis  
in yeast  
A82-38585

**Page intentionally left blank**

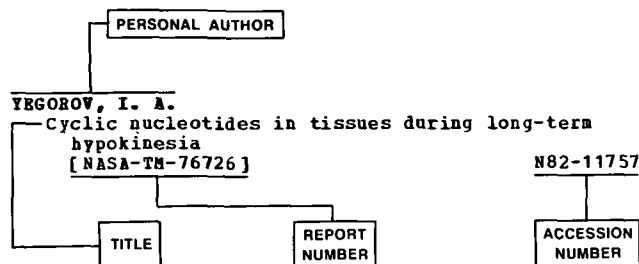
**Page intentionally left blank**

# PERSONAL AUTHOR INDEX

AEROSPACE MEDICINE AND BIOLOGY / A Continuing Bibliography (Suppl. 238)

NOVEMBER 1982

## Typical Personal Author Index Listing



The title of the document is used to provide the user with a brief description of the subject matter. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

## A

- ABBOTT, R. A.**  
Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218
- ABBOTT, U. K.**  
Embryonic development during chronic acceleration  
A82-40755
- ABE, M.**  
Effect of athletic training on physical fitness under hypodynamics  
A82-40663  
Relation between physiological effects of gravitational forces and that of magnetic forces  
A82-40730  
Relation between physiological effects of gravitational forces and that of magnetic forces. II  
A82-40771
- ABRAHAM, S.**  
Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129  
A82-40698
- ABULADZE, L. A.**  
The use of an audio-frequency magnetic field in certain diseases  
A82-41473
- ABYZOV, S. S.**  
Mycelial fungi, isolated from the ice sheet of the central Antarctic  
A82-39428  
The microflora of the central Antarctica glacier and control methods for the sterile isolation of an ice core for microbiological analyses  
A82-39430
- ACLAND, W. D.**  
Ambiguity and the evolution of the genetic code  
A82-38120
- ADACHI, R. R.**  
Bone resorption and calcium absorption in rats during spaceflight  
A82-40704
- ADAMIAN, S. IA.**  
Temperature characteristics of the ouabain-insensitive sodium flux in frog muscles  
A82-38600
- AFANASEV, IU. I.**  
The structure and function of macrophages  
A82-41470
- AFONIN, B. B.**  
Role of hormonal compounds in regulation of electrolyte metabolism in the presence of emotional stress  
N82-28952
- AGSTERIBBE, E.**  
Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of *Neurospora crassa*  
A82-38698
- AHLERS, I.**  
Space flight effects upon plasma and tissue lipids in rats  
A82-40722
- AHLERSOVA, E.**  
Space flight effects upon plasma and tissue lipids in rats  
A82-40722
- AIVAZIAN, T. A.**  
The influence of psychological and somatic factors on the symptomatics of hypertension  
A82-41492
- AKHMEDOV, R.**  
Effect of high ambient temperature on carbohydrate metabolism in rat liver and skeletal muscles  
N82-28975
- AKIPEV, A. P.**  
Radiation-induced shortening of the life span of *D. melanogaster*. II - Sensitizing effects of 5-bromo-2-deoxyuridine  
A82-38155
- AKOPIAN, G. A.**  
The speed of blood flow in athletes subjected to the combined action of a training regime and high-altitude climatic factors  
A82-41505
- ALDERSONS, A. A.**  
Phase analysis of dynamics of galvanic skin responses in man  
N82-29861
- ALEINIKOVA, L. I.**  
The detection of premorbid states and cardiovascular diseases during medical examinations of seamen  
A82-38553
- ALEKSANDROV, P. N.**  
The microcirculatory bed of the lungs after an effect exerted on the right vagus nerve  
A82-40497
- ALEKSANDROV, V. N.**  
Migration kinetics of hemopoietic stem cells in mice after severe mechanical trauma  
A82-38541
- ALEKSEEV, E. I.**  
Results of morphological investigations aboard biosatellites Cosmos  
A82-40697
- ALEKSEEV, S. I.**  
The mechanism of the microwave effect on the conductivity of bilayer lipid membranes  
A82-38587
- ALEKSEUEV, Y. I.**  
Preparation of labyrinthectomized animals for flight aboard Cosmos-936 biosatellite  
N82-28971
- ALPEROVA, I. V.**  
Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations  
A82-39429  
Dynamics of left ventricular systolic phase structure during long-term (140-185 days) spaceflights  
N82-28954

- ALLIKHETS, L. KH.**  
The influence of the GABA-receptor blocker  
bicuculline on the effects of fenibut and diazepam  
A82-38539
- ALLISON, T. G.**  
Effect of induced erythrocythemia on hypoxia  
tolerance during physical exercise  
A82-41218
- ALTMAN, IA. A.**  
Characteristics of human auditory evoked  
potentials during the lateralization of a  
'moving' auditory image  
A82-40465
- ALWIS, K. W.**  
Chemical evolution. XL - Clay-mediated oxidation  
of diaminomaleonitrile  
A82-41196
- AMBARTSUMIAN, T. G.**  
Temperature characteristics of the  
ouabain-insensitive sodium flux in frog muscles  
A82-38600
- AMRAGOVA, M. G.**  
The correlations of the central nervous system and  
thyroid functions in conditions of chronic  
emotional stress  
A82-40453
- ANBOIAN, E. A.**  
Prostaglandins and regulation of cerebral  
circulation under conditions of the altered  
gaseous composition of the blood  
A82-38561
- ANANEV, B. E.**  
The conditions attending muscular strain in work  
involving only a few types of movements  
A82-38569
- ANASHKIN, O. D.**  
Investigation of the cardiovascular system during  
prolonged space flights on board the Salyut  
space stations  
A82-39429
- ANDREEV, B. V.**  
The anti-stress role of the gamma-aminobutyric  
acid system of the brain  
A82-40468
- ANDREYEVA, V. G.**  
Endurance of +Gz G forces by middle-aged people  
before and after 7-day immersion  
A82-28958
- ANDRISANI, D.**  
Experimentally determined pilot models using  
hovering VTOL flight data  
[AIAA PAPER 82-1294]  
A82-40277
- ANICHIN, V. F.**  
Alterations in the labyrinth receptors after laser  
irradiation as detected by electron microscopy  
A82-39244  
Preparation of labyrinthectomized animals for  
flight aboard Cosmos-936 biosatellite  
A82-28971
- ANISIMOV, B. V.**  
Modification of method for assaying ozone by the  
diacetyl dihydrolutidine reaction  
A82-28973
- ANIUKHOVSKII, E. P.**  
The effect of diethylamine analog of ethmozine on  
the functional condition of myocardium /Clinical  
and experimental study/  
A82-41488
- ANOKHIN, IU. N.**  
Radiation damage and recovery of mouse T-cells. IV  
- Elimination of radiation-induced migration  
abnormalities in T-lymphocytes  
A82-38156
- ANTONENKO, V. T.**  
The participation of the lymphatic system in the  
resistance of an organism to hypoxia  
A82-39793
- ANTONOV, S. G.**  
X-ray study of loaded skeletal portions in the  
upper extremities of athletes engaging in karate  
A82-40490
- ANTROPOV, G. A.**  
A method of evaluating the functional state of the  
central nervous system of a person performing work  
A82-38579
- ANZINIROV, V. L.**  
Regulation of cerebral circulation in erect position  
A82-28957
- APOSTOLAKIS, M.**  
The effects of human growth hormone administration  
on the functional status of rat atrophied muscle  
following immobilization  
A82-40715
- ARKHANGELSKAIA, M. I.**  
The correlations of the central nervous system and  
thyroid functions in conditions of chronic  
emotional stress  
A82-40453
- ARMSTRONG, R. D.**  
Aircraft and crew scheduling during airlift  
operations  
[AD-A114114]  
A82-29011
- ARSLANOVA, R. M.**  
Synchronization of cardiovascular accidents with  
physical clocks  
A82-28956
- ARTAMONOVA, M. P.**  
Endurance of +Gz G forces by middle-aged people  
before and after 7-day immersion  
A82-28958
- ASADA, H.**  
Control of a direct-drive arm  
[AD-A114969]  
A82-29903
- ASEEVA, L. G.**  
An evaluation of the informativeness of EKG  
parameters in diagnosing a myocardial infarction  
of the back wall of the left ventricle  
A82-41493
- ASLANAZOVA, V. I.**  
Application of xylite for the detection of  
labyrinthine hydrops  
A82-39243
- AUFRETT, R.**  
Standards of physical condition for private pilots  
of aircraft and gliders  
A82-38847  
Physiopathology and pathology of spinal injuries  
in aerospace medicine  
[AGARD-AG-250 (ENG)]  
A82-29870  
Spinal stresses in flight  
A82-29873  
Aetiology and pathogenesis  
A82-29875  
Ejection of pilots from combat aircraft  
A82-29877  
Fractures of the spine in flight  
A82-29880  
Accidents in centrifuges and experiments (ejection  
seat training towers, sleds)  
A82-29881  
Backache in helicopter pilots  
A82-29887  
The cervical column of pilots of combat aircraft  
A82-29888  
The spine and fitness for flight  
A82-29889  
Medico-legal aspect of spinal disorders in  
aviation medicine  
A82-29892
- AUSLANDER, D. M.**  
An approach to the preliminary evaluation of  
Closed Ecological Life Support System (CELSS)  
scenarios and control strategies  
[NASA-CR-166368]  
A82-29897
- AUXIER, J. A.**  
What is ALARA  
[DE81-030814]  
A82-28995
- AVAKIAN, V. A.**  
Cytogenetic effect of 5-fluoro-2desoxy uridine in  
the G2 phase on intact and X-irradiated crepis  
capillaris L cells  
A82-40461
- AYIKOV, G. S.**  
Preparation of labyrinthectomized animals for  
flight aboard Cosmos-936 biosatellite  
A82-28971
- AZATIAN, R. A.**  
Cytogenetic effect of 5-fluoro-2desoxy uridine in  
the G2 phase on intact and X-irradiated crepis  
capillaris L cells  
A82-40461

## B

- BABUNASHVILI, I. N.**  
The incorporation of an erythrocyte membrane into planar bilayer lipid membranes  
A82-38606
- BADZHEINIAN, S. A.**  
The conductivity of model protein-lipid membranes  
A82-38604
- BAG, S. H.**  
Effect of postural changes on minute ventilation, functional residual capacity and pulmonary N<sub>2</sub> clearance  
A82-40660
- BAGDASARYAN, G. A.**  
Microorganisms used to monitor environmental pollution  
N82-28978
- BAGEL, G. E.**  
Dynamics of the brain electric activity in patients with cerebral insults under the effect of muscle stimulation with sinusoidal modulated currents  
A82-41477
- BAGIROV, IU. F.**  
Electrical stimulation of the urinary bladder following radical surgery for cancer of the rectum  
A82-41479
- BAHNSON, H. T.**  
Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218
- BAIBEKOV, I. M.**  
The response of the venous walls in the extremities to a disturbed venous outflow  
A82-40493
- BAICHOROVA, L. I.**  
Optimization of medicinal electrophoresis  
A82-41472
- BAILY, P. E.**  
Neutron radiation dosimetry in high altitude flight personnel  
A82-40444
- BAKSHINIAN, M. Z.**  
The structure and function of macrophages  
A82-41470
- BALDIN, U. I.**  
Vibration and decompression gas bubbles  
A82-40729
- BARABANOVA, V. V.**  
The regulation of calcium exchange in the cells of different regions of the warm-blooded animal heart  
A82-40313
- BARANOV, V. D.**  
Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats  
A82-38159
- BARANSKI, S.**  
Ultrastructural qualitative and quantitative evaluation of cytoplasmatic structures of heart muscle of rats living aboard biosputnik Kosmos 936  
A82-40694
- BARANY, J. W.**  
Development of a methodology for assessing aircrew workloads  
[AD-A114364]  
N82-29010
- BARATS, S. S.**  
Immunological reactions to lipoproteins and heparin in young men with a hereditary tendency to atherosclerosis  
A82-41487
- BARNABAS, J.**  
Evolution of major metabolic innovations in the Precambrian  
A82-38121
- BARNES, G. R.**  
A procedure for the analysis of nystagmus and other eye movements  
[AD-A112603]  
N82-28987
- BARON, R.**  
Bone growth in the rat mandible during space flight  
A82-40705
- BARON, W. S.**  
Field sensitivity of the 'red' mechanism derived from primate local electroretinogram  
A82-39431
- BAROSS, J. A.**  
Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria  
A82-39422
- BARREERE, M.**  
Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system  
A82-40656
- Orthostatic tolerance and exercise response before and after 7 days simulated weightlessness  
A82-40731
- BASHNAKOV, G. A.**  
Factors of the natural resistance of the body and methods for studying them  
A82-40308
- BATUEV, A. S.**  
Higher integrative systems of the brain  
A82-40642
- BAUGHMAN, L. D.**  
Segmentation and analysis of stereophotometric body surface data  
[AD-A114916]  
N82-29868
- BAYLINK, D. J.**  
A new rat model simulating some aspects of space flight  
A82-40655
- Altered bone turnover during spaceflight  
A82-40679
- Effect of space flight on bone strength  
A82-40680
- Evidence for arrested bone formation during spaceflight  
A82-40767
- BAZILIUK, O. V.**  
Changes in the hemodynamics and efferent activity in the renal nerve with acute hypoxic hypoxia under the stabilization of perfusion pressure in carotid sinuses  
A82-38161
- BECKER, R.**  
Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218
- BEDFORD, T. G.**  
Metabolic and cardiovascular adaptations in trained hypophysectomized rats  
A82-41215
- BEER, G.**  
Training of personnel specialized in cartography  
N82-29669
- BELIAKOVA, L. A.**  
Mycelial fungi, isolated from the ice sheet of the central Antarctic  
A82-39428
- BELKINA, I. M.**  
Prevention of heart function abnormalities during reoxygenation after ischemia by adaptation to altitude hypoxia  
A82-40455
- BELLUSCHI, A.**  
Cardiac and cerebral vascular adaptation to gravitational stresses in man  
A82-40765
- BELOKRINITSKII, V. S.**  
A hygienic evaluation of the biological effects of nonionizing microwave radiation  
A82-41464
- BELOSHAPKO, G. G.**  
The effect of diethylamine analog of ethmozine on the functional condition of myocardium /Clinical and experimental study/  
A82-41488
- BELOV, I. M.**  
Characteristics of human auditory evoked potentials during the lateralization of a 'moving' auditory image  
A82-40465
- BELOVA, T. I.**  
Ultrastructural changes in the brains of rats subjected to acute emotional stress  
A82-38558
- BENEVOLENSKIY, V. N.**  
Synchronization of cardiovascular accidents with physical clocks  
N82-28956

- BERDYSHEV, V. V.**  
Some characteristics of the diurnal rhythm of physiological functions of sailors in the tropics  
A82-38180
- BERENYI, E.**  
Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness  
A82-40709  
The effect of hypokinesia and hypoxia on the function of muscles  
A82-40739
- BEREZOVSKII, V. A.**  
The effect of helium on gas exchange and tissue respiration  
A82-38165
- BERNADSKII, V. I.**  
Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations  
A82-39429
- BES, A.**  
Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system  
A82-40656  
Orthostatic tolerance and exercise response before and after 7 days simulated weightlessness  
A82-40731  
Effects of prolonged bedrest in antiorthostatic position on rCBF measured by  $^{133}\text{Xe}$  inhalation technique - Effects of clonidine  
A82-40743
- BETSKII, O. V.**  
Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions  
A82-38586
- BEZHANAT, G.**  
Vestibular screening of cosmonauts  
A82-38853
- BISHOP, V. S.**  
Effect of baroreceptor denervation on +G sub z tolerance in dogs  
A82-40675
- BLAGOVESHCHENSKAIA, N. S.**  
Otoneurological symptoms and syndromes  
A82-39286
- BLOWER, D. J.**  
Determining visual acuity thresholds: A simulation study of stimulus presentation strategies  
[AD-A111821]  
N82-28992
- BOBIN, M. E.**  
The microflora of the central Antarctica glacier and control methods for the sterile isolation of an ice core for microbiological analyses  
A82-39430
- BOBROVNITSKIY, M. P.**  
Intracutaneous partial oxygen pressure (pO<sub>2</sub> sub ic) in man during short-term space flights: Results of joint USSR-GDR space flight  
N82-30278
- BOBYN, J. D.**  
Evidence for arrested bone formation during spaceflight  
A82-40767
- BOCA, A.**  
The reaction of simulated and true weightlessness on digestive tract of rats  
A82-40733
- BOCK, O. L.**  
Dynamics of subjective discomfort in motion sickness as measured with a magnitude estimation method  
A82-40438
- BODO, D.**  
Efficacy of kavinton in prevention of motion sickness  
N82-28961
- BOGDANOV, A. I.**  
The gradualness of the reaction of the pituitary-adrenocortical system to activating and inhibiting signals  
A82-40315
- BOGWAN, L.**  
The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats  
A82-40713
- BOGOLEPOV, M. M.**  
Ultrastructural changes in the brains of rats subjected to acute emotional stress  
A82-38558
- BONDAREV, G. I.**  
Energy requirements of workers at an oil field in western Siberia  
A82-40481
- BONDE-PETERSEN, F.**  
Cardiovascular responses to isometric exercise during simulated zero gravity  
A82-40662  
Aspects of cardiovascular adaptation to gravitational stresses  
A82-40687  
Vestibular effects of water immersion and Clonidine  
A82-40762  
The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity  
A82-40763  
Cardiovascular effects of Clonidine during 20 hours head down tilt /-5 deg/  
A82-40764
- BONNER, W. A.**  
The radiolysis and racemization of leucine on proton irradiation  
A82-38118
- BORDEIANU, A.**  
The reaction of simulated and true weightlessness on digestive tract of rats  
A82-40733
- BORISOVA, L. F.**  
An improved apparatus for venous occlusion plethysmography  
A82-38548
- BOURNE, S. M.**  
Experimentally determined pilot models using hovering VTOL flight data  
[AIAA PAPER 82-1294]  
A82-40277
- BOUSQUET, J.**  
Orthostatic tolerance and exercise response before and after 7 days simulated weightlessness  
A82-40731
- BOYNTON, R. M.**  
Field sensitivity of the 'red' mechanism derived from primate local electroretinogram  
A82-39431
- BRAAK, L.**  
Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system  
A82-40656  
Orthostatic tolerance and exercise response before and after 7 days simulated weightlessness  
A82-40731
- BRAGIN, A. G.**  
The effect of the electrical stimulation of afferent pathways on neurons in septal slices  
A82-40469
- BRAGIN, E. O.**  
The role of central gray matter in the activation of antipain systems of the rat's brain under stress  
A82-38547
- BRANSKAIA, A. N.**  
A study of temporary absences from work arising from disorders of the circulatory system  
A82-38555
- BRATRICE, E. S.**  
Long-term and progressive changes in Rhesus spectral sensitivity after low-level coherent light (514nm exposure)  
[AD-A111639]  
N82-28946
- BRAUN, A. D.**  
The effect of urea and heat on the activity of lactate dehydrogenase and glucose 6-phosphate dehydrogenase  
A82-38612
- BRESLAV, I. S.**  
Possible impairment of respiratory regulation under hyperbaric nitrogen narcosis  
N82-28964
- BRIEGLER, W.**  
Human lymphocyte activation is depressed at low-g and enhanced at high-g  
A82-40658  
Changes of periodic protoplasmic movements on the fast clinostat  
A82-40725



- Response of cultured cells to hyper- and hypogravity  
A82-40773
- BRITUN, A. I.  
Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats  
A82-38159
- BROCK, P. J.  
Effect of physical training in cool and hot environments on +Gz acceleration tolerance in women  
A82-40664
- BROWN, A. E.  
Research opportunities and limitations of protracted hypogravity simulations for plant gravitational physiology  
A82-40653  
Initiation of nutation in sunflower hypocotyls  
A82-40724
- BRU, A.  
Effects of prolonged bedrest in antiorthostatic position on rCBF measured by  $^{133}\text{Xe}$  inhalation technique - Effects of clonidine  
A82-40743
- BRYANOV, I. I.  
Initial audiometric investigations in an orbital station  
N82-30277
- BRYANTSEVA, L. A.  
Possible impairment of respiratory regulation under hyperbaric nitrogen narcosis  
N82-28964
- BUCK, J. E.  
Development of a methodology for assessing aircrew workloads  
[AD-A114364]  
N82-29010
- BUCKALEW, L. W.  
Subjective response to negative air ion exposure  
A82-40446
- BUGAEV, S. A.  
The physiological mechanisms of the arousal response in animals under conditions of hypobiosis  
A82-40311
- BUJANOVSKAIA, O. A.  
Application of xylite for the detection of labyrinthine hydrops  
A82-39243
- BULGAKOVA, M. A.  
Vegetative reactions to the administration of atropine and propranolol in rats that exhibit different types of behavior  
A82-40463
- BUONO, R. J.  
Acid-base, metabolic, and ventilatory responses to repeated bouts of exercise  
A82-41219
- BURGER, R. E.  
Effects of high-G on ventilation/perfusion in the domestic fowl  
A82-40672
- BURKITBAEV, S. M.  
Determination of blood-lipoprotein dimensions by optical methods  
A82-38593
- BURKOVAKAYA, T. Y.  
Methodological aspects of testing erythrocyte balance by counting incubated reticulocytes  
N82-28972
- BURLAKOVA, E. B.  
Study of the relation between the number of sulfhydryl groups and the level of lipid antioxidant activity in the organs of individual animals of different species  
A82-38153
- BURNS, J. W.  
Restraint of animals in space research  
A82-40748
- BURR, M. J.  
Alcohol-induced physiological displacements and their effects on flight related functions  
[AD-A114919]  
N82-29867
- BURTON, R. E.  
Gravitational adaptation of animals  
A82-40716  
Restraint of animals in space research  
A82-40748
- BURTSEVA, S. A.  
The effect of laser radiation on lipid synthesis in yeast  
A82-38585
- BUSCH, I.  
ADH suppression under immersion combined with dehydration  
A82-40776
- C**
- CANANAU, S.  
Na<sup>+</sup>/K<sup>+</sup> dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats  
A82-40707  
The reaction of simulated and true weightlessness on digestive tract of rats  
A82-40733
- CANN, C. E.  
Bone resorption and calcium absorption in rats during spaceflight  
A82-40704
- CANTRELL, J. H., JR.  
Ultrasonic determination of thermodynamic threshold parameters for irreversible cutaneous burns  
A82-41122
- CARA, M.  
Medical emergencies on board airliners - Ground management  
A82-38846
- CARLSON, E.  
Cardiovascular responses of the chronically instrumented monkey during simulated space flight  
A82-40670
- CARPENTER, J.  
Effect of warm-up on left ventricular response to sudden strenuous exercise  
A82-41212
- CARRE, R.  
The clinical selection of astronauts at the C.P.E.M.P.N  
A82-38852
- CARTER, D. E.  
Effect of space flight on bone strength  
A82-40680
- CARTER, R. C.  
Task analysis and the ability requirements of tasks: Collected papers  
[AD-A111181]  
N82-29000
- CASALI, J. G.  
Human/computer transaction tasks: An annotated bibliography  
[AD-A114800]  
N82-29902
- CASTLEMAN, K. R.  
Morphometric analysis of rat muscle fibers following space flight and hypogravity  
A82-40703
- CATER, J. P.  
A functional video-based anthropometric measuring system  
[NASA-CR-167637]  
N82-29896
- CATTANEO, A.  
Contrast influence on perceived orientation  
A82-38796
- CHAE, E. U.  
Effect of postural changes on minute ventilation, functional residual capacity and pulmonary N<sub>2</sub> clearance  
A82-40660
- CHAKHAVA, O. V.  
Occult bacterial persistence and resistance to colonization after antibiotic therapy  
A82-40460
- CHAPMAN, D. K.  
Initiation of nutation in sunflower hypocotyls  
A82-40724
- CHARNES, R. D.  
Aircraft and crew scheduling during airlift operations  
[AD-A114114]  
N82-29011
- CHASOVNIKOVA, L. V.  
An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane  
A82-38607

- CHATINIAN, A. A.  
The speed of blood flow in athletes subjected to the combined action of a training regime and high-altitude climatic factors  
A82-41505
- CHEKNOV, Z. S.  
Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions  
A82-38586
- CHERTISHCHEV, V. V.  
The mechanism of the microwave effect on the conductivity of bilayer lipid membranes  
A82-38587
- CHRISTENSEN, E.  
Acclimatization to dry heat: Active men versus active women  
[AD-A111708]  
N82-28993
- CHRISTENSEN, H. J.  
Aspects of cardiovascular adaptation to gravitational stresses  
A82-40687
- CHUI, L. A.  
Morphometric analysis of rat muscle fibers following space flight and hypogravity  
A82-40703
- CHUKAEVA, I. I.  
Functional properties of T-lymphocytes in patients with acute myocardial infarction  
A82-41459
- CHUMAKOV, V. I.  
The microcirculatory bed of the lungs after an effect exerted on the right vagus nerve  
A82-40497
- CHURILOV, L. P.  
Microcalorimetry in biomedical investigations  
A82-41471
- CICCONE, V. J.  
Technical assessment of the prevention of micro-fouling on OTEC heat-transfer surfaces through the use of ultraviolet radiation  
[DE82-005489]  
N82-29850
- CODE, C. F.  
Involuntary and voluntary mechanisms for preventing cerebral ischemia due to positive /Gz/ acceleration  
A82-40747
- COGOLI, A.  
Human lymphocyte activation is depressed at low-g and enhanced at high-g  
A82-40658  
Effect of spaceflight on lymphocyte stimulation  
A82-40700  
Response of cultured cells to hyper- and hypogravity  
A82-40773
- COLEMAN, R. H.  
Rotating shift work schedules that disrupt sleep are improved by applying circadian principles  
A82-38325
- COLIN, J.  
Physiological stresses linked to flight on airliners  
A82-38842
- COLLYER, S. C.  
Unconventional visual displays for flight training  
[AD-A111392]  
N82-28999
- COMINE, D. L.  
Superior heat-transfer fluids for solar heating and cooling applications. Results of acute oral toxicity determinations  
[DE82-003071]  
N82-29869
- CONNOLLY, J. P.  
Temperature and behavioral responses of squirrel monkeys to 2Gz acceleration  
A82-40774
- CONNORS, J. H.  
Altitude-induced changes in plasma thyroxine, 3,5,3 prime-triiodothyronine, and thyrotropin in rats  
A82-41207
- CONZETT, H. E.  
The radiolysis and racemization of leucine on proton irradiation  
A82-38118
- CORDT, I.  
Human lymphocyte activation is depressed at low-g and enhanced at high-g  
A82-40658
- COSTILL, D. L.  
Relationship between muscle Qo2 and fatigue during repeated isokinetic contractions  
A82-41216
- COX, W. J.  
Flight crewmember workload evaluation  
[AD-A114167]  
N82-29012
- CRAMER, D. B.  
Antimotion-sickness efficacy of scopolamine 12 and 72 hours after transdermal administration  
A82-40437
- CRANCE, J. P.  
Physiological stresses in flying a sailplane  
A82-38850
- CROWHOVER, J. C.  
Effect of simulated weightlessness on energy metabolism in the rat  
A82-40677
- CYNADER, M.  
Neurons in cat visual cortex tuned to the direction of motion in depth - Effect of positional disparity  
A82-39434
- CZEISLER, C. A.  
Rotating shift work schedules that disrupt sleep are improved by applying circadian principles  
A82-38325

## D

- DAMEN, A. A. H.  
On the observability of electrical cardiac sources  
A82-41450
- DANJANOVICH, Z.  
Modeling and simulation in the study of certain biological systems  
A82-39570
- DANILEIKO, V. I.  
The participation of the lymphatic system in the resistance of an organism to hypoxia  
A82-39793
- DANILOV, R. K.  
Myosatelloocytes and cambial properties of skeletal and muscular tissue  
A82-41469
- DANILOVA, V. M.  
Reactions of O-18 exchange in the myosin systems of skeletal, cardiac, and smooth muscles  
A82-38614
- DARIANIN, V. IU.  
The rate at which exogenous hydrocortisone is eliminated from peripheral blood flow in patients suffering from an acute myocardial infarction  
A82-41498
- DARINSKAYA, V. S.  
Changes of intracellular rest potential and the length of isolated muscle under different loads  
A82-40480
- DATILINKA, I.  
Space flight effects upon plasma and tissue lipids in rats  
A82-40722
- DAULERIO, L. A.  
Simulation of the motion of the center of mass of an occupant under ejection accelerations  
[AD-A113806]  
N82-28989
- DAVIDOV, V. V.  
The concentration of adenyl nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress  
A82-38560
- DAYAWANDAN, P.  
Gravity perception and asymmetric growth in plants - A model derived from the grass pulvinus  
A82-40775
- DAYHOFF, M. O.  
Evolution of major metabolic innovations in the Precambrian  
A82-38121
- DEAVERES, D. R.  
A new rat model for studies of hypokinesia and antiorthostasis  
A82-40706  
Suspension restraint - Induced hypokinesia and antiorthostasis as a simulation of weightlessness  
A82-40744

- DEBIEC, H.**  
Rhythms of electrolytes and hydroxyproline excretion in urine of rats after three weeks of weightlessness - Biosatellite Cosmos-1129 A82-40693  
Some of biochemical parameters in rat brain during +Gz acceleration A82-40717
- DEBOV, S. S.**  
A factor of resistance to emotional stress in the brain of rats A82-40452
- DEDEUKO, I. I.**  
The effect of the natural and climatic conditions of the Far North on the human cardiovascular system A82-41466
- DEDOV, V. I.**  
Delayed effects of the internal irradiation of endocrine system in female rats A82-38582
- DEPOUV, D. O.**  
Effect of sustained Gz acceleration on lung fluid balance - An ultrastructural study A82-40761
- DELAHAYE, R. P.**  
Physiopathology and pathology of spinal injuries in aerospace medicine [AGARD-AG-250(ENG)] N82-29870  
Anatomy of the spine N82-29871  
Biomechanics of the spine N82-29872  
Theories of the pathogenesis of fractures of the spine N82-29874  
Aetiology and pathogenesis N82-29875  
Helicopter accidents N82-29876  
Ejection of pilots from combat aircraft N82-29877  
Parachuting N82-29878  
Fractures of the spine in flight N82-29880  
Accidents in centrifuges and experiments (ejection seat training towers, sleds) N82-29881  
Radiology of spinal trauma in aviation medicine N82-29883  
Sequelae of vertebral fractures and trauma N82-29886  
Backache in helicopter pilots N82-29887  
The cervical column of pilots of combat aircraft N82-29888  
The spine and fitness for flight N82-29889  
Medico-legal aspect of spinal disorders in aviation medicine N82-29892
- DELIGIANNIS, A.**  
The effects of human growth hormone administration on the functional status of rat atrophied muscle following immobilization A82-40715
- DEMBO, A. G.**  
Dyspnea - What is it A82-41461
- DEMETSKII, A. M.**  
Sources of an artificial magnetic field for implantation /experimental study/ A82-41480
- DEMIN, M. M.**  
Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat A82-40699
- DENISOV-NIKOLSKII, I. I.**  
Peculiarities of the relief of the trabecular surface of the spongy substance of the human vertebrae A82-40492
- DENISOV, V. K.**  
The diagnostic value of phonoenterography in acute renal failure A82-40478
- DEROSHIA, C. W.**  
Influences of horizontal hypokinesia on performance and circadian physiological rhythms in female humans A82-40682
- DEROSIER, D. J.**  
F-actin is a helix with a random variable twist A82-38694
- DESHEVOI, I. U. B.**  
Early reaction of the hemopoietic organs depending on the condition of the peripheral M-cholinergic systems A82-38168  
The early reaction of the hemopoietic organs to stress, depending on the condition of the peripheral M-cholinergic systems A82-40499
- DEVIATKOV, N. D.**  
Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions A82-38586
- DICKEY, D. T.**  
Changes in blood volume and response to vaso-active drugs in horizontally casted primates A82-40657
- DIDENKO, I. Y.**  
Osteoporosis in unsupported extremities N82-28970
- DIMITROV, G.**  
Retinal location and visual localization during pursuit eye movement A82-39436
- DISHUKES, K.**  
Aging and visual function of military pilots - A review A82-40435
- DIXON, W. B.**  
Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating A82-38795
- DOBRETISOV, G. E.**  
Determination of blood-lipoprotein dimensions by optical methods A82-38593
- DOKTOROV, A. A.**  
Peculiarities of the relief of the trabecular surface of the spongy substance of the human vertebrae A82-40492
- DOMRACHEVA, M. V.**  
Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations A82-39429
- DONOVAN, W. J.**  
Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating A82-38795
- DOROGOVA, E. V.**  
Electrical stimulation of the urinary bladder following radical surgery for cancer of the rectum A82-41479
- DOROKHOVA, L. M.**  
Local cerebral blood flow dynamics during experimental ischemia A82-38544
- DOURY, P.**  
Clinical examination of spinal injuries N82-29882  
The spine and fitness for flight N82-29889  
Medico-legal aspect of spinal disorders in aviation medicine N82-29892
- DOZOLNE, E.**  
The nature and rate of occurrence of medical emergencies on board Air France aircraft A82-38841
- DRAGANIC, I.**  
The radiolysis of aqueous propionitrile - Compounds of interest to chemical evolution studies A82-41197

## DRAGANIC, Z.

The radiolysis of aqueous propionitrile -  
Compounds of interest to chemical evolution  
studies

A82-41197

## DRAGONIR, C. T.

Na<sup>+</sup>/-K<sup>+</sup>/ dependent ATP-ase modifications of  
skeletal muscle and myocardium of hypokinetic rats

A82-40707

## DREHIN, S. A.

The effect of diethylamine analog of ethmozine on  
the functional condition of myocardium /Clinical  
and experimental study/

A82-41488

## DRINKWATER, B. L.

Thermoregulation and the menstrual cycle

A82-40441

## DROZD, A. I.

Study of the radioprotective effectiveness of an  
hypoxic gas mixture during combined radiation  
and thermal injuries to rats

A82-38159

## DROZDOVA, G. A.

Morphological and functional factors contributing  
to a hypertonic heart

A82-38557

## DRUMMOND, B. J.

Circadian changes in resting heart rate and body  
temperature, maximal oxygen consumption and  
perceived exertion

A82-38268

## DRUZHININA, R. A.

Changes in mineralized tissues in the case of  
calcitonin and somatotrophic hormone injections  
under hypokinesia

A82-40503

## DUMANSKII, I. U. D.

Hygienic evaluation of an 8-mm-wave  
electromagnetic field

A82-41462

## DUPIK, V. S.

Energy requirements of workers at an oil field in  
western Siberia

A82-40481

## DURINIAN, R. A.

The role of central gray matter in the activation  
of antipain systems of the rat's brain under  
stress

A82-38547

## DURNEY, C. H.

Absorption characteristics of prolate spheroidal  
models exposed to the near fields of  
electrically small apertures

A82-38802

## DURNOVA, G. H.

Results of morphological investigations aboard  
biosatellites Cosmos

A82-40697

## DUTCHER, P. R.

Morphogenesis of a higher plant from cultured  
cells and embryos in space

A82-40666

## DUVALL, P.

Evidence for arrested bone formation during  
spaceflight

A82-40767

## DUX, E.

The effect of hypoxic and hypobaric exercises on  
the blood-brain barrier in rats

A82-40713

## DUX, L.

The effect of hypoxic and hypobaric exercises on  
the blood-brain barrier in rats

A82-40713

## DYMOND, D. S.

Effect of warm-up on left ventricular response to  
sudden strenuous exercise

A82-41212

## DYSON, P. J.

A model for the origin of life

A82-41198

## DZHEMUKHADZE, N. K.

The histochemistry of enzymes in specific skin  
glands of the European hedgehog /Erinaceus  
europeus/ during hibernation

A82-39792

## E

## ECONOMOS, A. C.

Gravity, metabolic rate and body size of mammals

A82-40678

## EDES, I.

Immobilization effects upon aerobic and anaerobic  
metabolism of the skeletal muscles

A82-40712

## EDWARDS, J. G.

Metabolic and cardiovascular adaptations in  
trained hypophysectomized rats

A82-41215

## EGELMAN, E. H.

F-actin is a helix with a random variable twist

A82-38694

## EGOROV, A. D.

Investigation of the cardiovascular system during  
prolonged space flights on board the Salyut  
space stations

A82-39429

Results of investigations of weightlessness

effects during prolonged manned space flights  
onboard Salyut-6

A82-40750

## EGOROV, V. IA.

The regulation of calcium exchange in the cells of  
different regions of the warm-blooded animal heart

A82-40313

## EIDSVIK, S.

Central nervous dysfunctions after near-miss  
accidents in diving

A82-40443

## EKHA, IA. E.

The significance of postextrasystolic potentiation  
in the preoperative assessment of the reversal  
of left-ventricle asynergy in patients with  
ischemic heart disease

A82-41483

## ELDRIDGE, M. W.

Instantaneous stroke volume in man during lower  
body negative pressure /LBNP/

A82-40683

Aortic and tibial bloodflow response to lower body  
negative pressure /LBNP/

A82-40727

Reduction in renal artery blood flow impedance  
during upright tilt in man

A82-40735

## ELIZABOVA, V. V.

The effect of certain characteristics of work  
motions on the tolerance of hand muscles to  
static exertions

A82-38568

## ELLER, A. K.

The changes in the concentration of free amino  
acids in muscles during exercise

A82-40314

## ELOIAN, M. A.

Study of contractile properties and composition of  
myofibrillar proteins of skeletal muscles in the  
Cosmos-1129 experiment

A82-40701

## ENNOVA, E. E.

Metabolism of the thermophilic hydrogenous  
bacterium *Pseudomonas thermophila* K-2

A82-39427

## EPHRATH, A.

Quantification of pilot workload via instrument scan  
[NASA-CR-169238]

A82-29900

## EPSHTEIN, I. M.

A respirator for training in conditions of  
changeable respiratory mixture

A82-40485

## ERONIN, P. T.

The effectiveness of perspiration in a hot  
environment

A82-38178

## ESIPOVA, N. G.

Acridine orange inhibition of the ATPase activity  
of myosin and its fragments

A82-38613

## ETTINGER, E.

As if in weightlessness

A82-40474

- EVANS, J. W.  
Bone growth and composition in weanling and mature rats exposed to chronic centrifugation  
A82-40669

## F

- FALKEL, J. E.  
Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218
- FARIA, I. E.  
Circadian changes in resting heart rate and body temperature, maximal oxygen consumption and perceived exertion  
A82-38268
- FELLER, D. D.  
Atrophy of rat skeletal muscles in simulated weightlessness  
A82-40738
- FERRIS, J. P.  
Chemical evolution. XL - Clay-mediated oxidation of diaminomaleonitrile  
A82-41196
- FERTUKOVA, M. M.  
Separation of bone marrow cells in mice by free-flow electrophoresis  
A82-38536
- FILARETOV, A. A.  
The gradualness of the reaction of the pituitary-adrenocortical system to activating and inhibiting signals  
A82-40315
- FILARETOVA, L. P.  
The gradualness of the reaction of the pituitary-adrenocortical system to activating and inhibiting signals  
A82-40315
- FILATOVA, L. G.  
Acridine orange inhibition of the ATPase activity of myosin and its fragments  
A82-38613
- FILIUSHKIN, I. V.  
Setting safety standards for ionizing radiation  
A82-38580
- FINDLAY, J. M.  
Global visual processing for saccadic eye movements  
A82-39435
- FITTS, R. H.  
Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle  
A82-41209
- FLEROV, M. H.  
Changes in man's constant electric field in the course of adaptation to hypokinesia  
A82-38595
- FLETCHER, E. R.  
The biological effects of repeated blasts  
[AD-A113113] N82-28990
- FOLEY, M. E.  
Determination of maximal aerobic power during upper body exercise  
[AD-A111712] N82-29866
- FOSTER, C.  
Effect of warm-up on left ventricular response to sudden strenuous exercise  
A82-41212
- FOURN, P.  
Medical emergencies on board an airliner - Procedures when a doctor is on board  
A82-38844
- FWLER, G. S.  
Rule-based programming for human-computer interface specification  
[AD-A113036] N82-29007
- FRANCESCOVI, R. P.  
Hypo- and hyperglycemia in rats: Effects on the ability to work in the heat  
[AD-A111711] N82-29849
- FRANCIS, M.  
F-actin is a helix with a random variable twist  
A82-38694
- FRANK, L.  
Protection from O2 toxicity by preexposure to hypoxia - Lung antioxidant enzyme role  
A82-41217
- FRANKLIN, C. I.  
Gravity perception and asymmetric growth in plants - A model derived from the grass pulvinus  
A82-40775
- FRANKSHTEIN, S. I.  
Respiratory movements of the facial muscles and respiratory resistance  
A82-40456
- FRIEBELE, E.  
Clay and the origin of life  
A82-38115
- FRISCH, G. D.  
Simulation of the motion of the center of mass of an occupant under ejection accelerations  
[AD-A113806] N82-28989
- FRITZE, B.  
Medical-biological investigations under space conditions: Present and future significance  
N82-30275
- FROISSART, B.  
In-flight incapacitation and pathology for the light aircraft stunt-flyer  
A82-38851
- FROLKIS, R. A.  
The role of the energy transport system in changes of the contractile function of the heart in the case of the measured limitation of coronary blood flow  
A82-41499
- FROLOV, V. A.  
Morphological and functional factors contributing to a hypertonic heart  
A82-38557
- FROLOVA, M. A.  
A study of temporary absences from work arising from disorders of the circulatory system  
A82-38555
- FRYER, T. B.  
Telemetry methods for monitoring physiological parameters  
A82-41551
- FULLER, C. A.  
Temperature and behavioral responses of squirrel monkeys to 2Gz acceleration  
A82-40774
- FURKALO, M. K.  
The amplitude of the R wave and the contractile function of the left ventricle in patients with ischemic heart disease  
A82-41486

## G

- GABRIELIAN, E. S.  
Prostaglandins and regulation of cerebral circulation under conditions of the altered gaseous composition of the blood  
A82-38561
- GABUDA, S. P.  
The temperature dependence of the H-1 NMR spectrum of hydrated collagen  
A82-38611
- GAFUROV, B. G.  
Characteristics of night sleep disorders in the case of myocardial infarction according to polygraphic data  
A82-41491
- GAGARIN, G. P.  
Use of the thermovision method in the prophylactic examination of polar workers  
A82-38565
- GAILONSKAIA, I. M.  
Occult bacterial persistence and resistance to colonization after antibiotic therapy  
A82-40460
- GAJDOS, L.  
Effect of immobilization on the ATPase activities and Ca-uptake of sarcoplasmic reticulum in different types of muscles  
A82-40708

- GALKINA, L. A.**  
Effects of cAMP accumulation activators on certain stages of genome expression in cells upon acute radiation damage to the organism. III Comparative study of the properties of RNA synthesized in a system of isolated liver and spleen cell nuclei from irradiated rats and animals having been treated with serotonin prior to irradiation  
A82-38157
- GALLE, R. R.**  
Efficacy of kavinton in prevention of motion sickness  
N82-28961
- GANDZIUK, V. M.**  
The effect of hypokinesia on the resistance of the heart to hypoxia  
A82-38170  
The effect of hypokinesia on the resistance of the heart to hypoxia  
A82-40502
- GARCIA, T. A.**  
Long-term and progressive changes in Rhesus spectral sensitivity after low-level coherent light (514nm exposure)  
[AD-A111639]  
N82-28946
- GARKUSHA, L. G.**  
The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension  
A82-40477
- GARRIGAN, G. A.**  
Technical assessment of the prevention of micro-fouling on OTEC heat-transfer surfaces through the use of ultraviolet radiation  
[DE82-005489]  
N82-29850
- GASANOV, Y. K.**  
Regulation of cerebral circulation in erect position  
N82-28957
- GAU, C. F.**  
Experimentally determined pilot models using hovering VTOL flight data  
[AIAA PAPER 82-1294]  
A82-40277
- GAUME, J. G.**  
Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting  
A82-40442
- GAVIN, A. P.**  
OTEC-1 power system test program: Biofouling and corrosion monitoring on OTEC-1  
[DE82-007035]  
N82-29851
- GAVERILOVA, L. M.**  
Efficacy of kavinton in prevention of motion sickness  
N82-28961
- GAZENKO, O. G.**  
Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites  
A82-40688  
Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat  
A82-40699  
USSR report. Space biology and aerospace medicine, volume 16, no. 3, May - June 1982  
[JPRS-81197]  
N82-28949
- GECSE, A.**  
The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats  
A82-40713
- GENIATULIN, K. V.**  
Microorganisms used to monitor environmental pollution  
N82-28978
- GENIN, A. M.**  
Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites  
A82-40688  
Skin temperature and thermal comfort in weightlessness  
A82-40726
- GEVARTER, W. B.**  
An overview of expert systems  
[NASA-CR-169197]  
N82-29899
- GILCHER, R.**  
Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218
- GINOZA, H. S.**  
Atrophy of rat skeletal muscles in simulated weightlessness  
A82-40738
- GINZBURG, S. E.**  
Dynamics of the brain electric activity in patients with cerebral insults under the effect of muscle stimulation with sinusoidal modulated currents  
A82-41477
- GISOLFI, C. V.**  
In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys  
A82-41214
- GLASER, P. E.**  
Nutrition and food technology for a Controlled Ecological Life Support System (CELSS)  
[NASA-CR-167392]  
N82-29004
- GLASSFORD, E. J.**  
Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting  
A82-40442
- GLOTTI, L. G.**  
The use of an audio-frequency magnetic field in certain diseases  
A82-41473
- GLYBIN, L. IA.**  
Diurnal dynamics of the indicators of the capacity for physical work and of physiological functions  
A82-41460
- GOBEHELIAHOV, A. M.**  
The detection of premonitory states and cardiovascular diseases during medical examinations of seamen  
A82-38553
- GOGVADEE, G. V.**  
Changes in electrically neutral Ca<sup>2+</sup>/H<sup>+</sup> exchange in rat liver mitochondria following gamma irradiation  
A82-38151
- GOLDMAN, R. F.**  
Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments  
A82-40440
- GOLIKOV, A.**  
As if in weightlessness  
A82-40474
- GOLINSKAIA, M. S.**  
A device for producing the action of static magnetic fields on biological objects  
A82-41482
- GOLOD, I. S.**  
Immunological reactions to lipoproteins and heparin in young men with a hereditary tendency to atherosclerosis  
A82-41487
- GOLOVKINA, O. L.**  
Endurance of +Gz G forces by middle-aged people before and after 7-day immersion  
N82-28958  
Human external respiration and gas exchange in acute period of adaptation to immersion in water  
N82-28959
- GOLOVNIKOV, L. M.**  
Psychic stress in athletic activity  
A82-40489
- GOLUBCHIKOVA, Z. A.**  
Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations  
A82-39429
- GOLUBEVA, T. I.**  
Modification of method for assaying ozone by the diacetyl dihydrolutidine reaction  
N82-28973
- GONCHARENKO, IU. D.**  
The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis  
A82-38169

- The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis  
A82-40501
- GOODENOUGH, R. D.  
Leucine and urea metabolism in acute human cold exposure  
A82-41211
- GORDON, C. J.  
Effect of heating rate on evaporative heat loss in the microwave-exposed mouse  
A82-41208
- GORDON, L. I.  
Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria  
A82-39422
- GORIACHKINA, V. L.  
The structure and function of macrophages  
A82-41470
- GOVERDE, M.  
Acceleration of HCN oligomerization by formaldehyde and related compounds - Implications for prebiotic syntheses  
A82-41199
- GOVOROVA, L. V.  
The content of cAMP and cGMP in brain tissues during adaptation to ischemia  
A82-40310
- GOVORUKHA, T. N.  
The effect of helium on gas exchange and tissue respiration  
A82-38165
- GOZULOV, S. A.  
Problem of accelerations in aviation medicine  
N82-28950
- GRAFOVA, G. IA.  
Cytoarchitectonics of the epidermis and the epidermal proliferative units /EPU/  
A82-40491
- GRAHAM, L. L.  
Instructor's role in individualized training: A survey of two computer managed courses [AD-A114917]  
N82-29894
- GRAYBIEL, A.  
Rapid perceptual adaptation to high gravito-inertial force levels Evidence for context-specific adaptation  
A82-40436
- Antimotion-sickness efficacy of scopolamine 12 and 72 hours after transdermal administration  
A82-40437
- GREENE, E. R.  
Instantaneous stroke volume in man during lower body negative pressure /LBNP/  
A82-40683
- Aortic and tibial bloodflow response to lower body negative pressure /LBNP/  
A82-40727
- Reduction in renal artery blood flow impedance during upright tilt in man  
A82-40735
- GREENE, P. R.  
Running in circles  
A82-40661
- GREENLEAF, J. E.  
Effect of physical training in cool and hot environments on +Gz acceleration tolerance in women  
A82-40664
- GREWADER, A. K.  
A study of the mechanism governing the different types of behavior exhibited by the spiral excitation wave period in auricle and ventricle  
A82-38597
- GRIGORENKO, G. P.  
Some characteristics of the diurnal rhythm of physiological functions of sailors in the tropics  
A82-38180
- GRIGOREV, A. I.  
Results of investigations of weightlessness effects during prolonged manned space flights onboard Salyut-6  
A82-40750
- GRIGOREVA, Z. G.  
Histochemical changes in experimental animals exposed to variable noise  
A82-38577
- GRIGORIAN, R. D.  
Baroreflex regulation of hemodynamics under orthostatic effects /an investigation with a mathematical model/  
A82-38162
- GRISHANOVICH, A. P.  
An automated system for the collection and processing of cardiovascular information from athletes  
A82-40484
- GROSSE, W. H.  
Development of a methodology for assessing aircrew workloads [AD-A114364]  
N82-29010
- GROZA, P.  
Na<sup>+</sup>/K<sup>+</sup> dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats  
A82-40707
- The reaction of simulated and true weightlessness on digestive tract of rats  
A82-40733
- GUALTIEROTTI, T.  
Gravity only dependent receptor field of the vestibular sensors Its significance in orbital flight  
A82-40770
- GUBA, P.  
Effect of immobilization on the ATPase activities and Ca-uptake of sarcoplasmic reticulum in different types of muscles  
A82-40708
- Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness  
A82-40709
- Effect of immobilization of the excitatory parameters of different type skeletal muscle  
A82-40710
- Effect of immobilization on the nonhistone protein composition in different types of skeletal muscles  
A82-40711
- Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles  
A82-40712
- Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization  
A82-40742
- GUBANOV, M. I.  
Natural and social determination of human psyche  
N82-28983
- GUBIN, G. D.  
The circadian rhythm of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles  
A82-40462
- GUELL, A.  
Effects of a weightlessness simulation on the velocity curves measured by Doppler sonography at the level of the carotid system  
A82-40656
- Orthostatic tolerance and exercise response before and after 7 days simulated weightlessness  
A82-40731
- Effects of prolonged bedrest in antiorthostatic position on rCBF measured by 133Xe inhalation technique - Effects of clonidine  
A82-40743
- The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity  
A82-40763
- GUREVICH, O. A.  
Separation of bone marrow cells in mice by free-flow electrophoresis  
A82-38536
- GUSAKOVA, G. A.  
Efficacy of kavinton in prevention of motion sickness  
N82-28961
- GUSAROV, A. S.  
Significance of minute volume parameters to evaluation of vestibular stability  
N82-29860
- GUSEV, V. A.  
Diagnosis and organization of the therapy of patients with disorders of blood circulation in the brain  
A82-38554



## H

- HAASE, H.**  
Twenty years of manned space flight from the viewpoint of space medicine  
N82-30276
- Intracutaneous partial oxygen pressure (pO<sub>2</sub> sub ic) in man during short-term space flights: Results of joint USSR-GDR space flight  
N82-30278
- HAGAN, W. J., JR.**  
Chemical evolution. XL - Clay-mediated oxidation of diaminomaleonitrile  
A82-41196
- HALLICK**  
Preprototype independent air revitalization subsystem  
[NASA-CR-167703]  
N82-29898
- HANAWALT, P. C.**  
Ligation of oligonucleotides by pyrimidine dimers - A missing 'link' in the origin of life  
A82-39423
- HANCOCK, P. A.**  
Task categorization and the limits of human performance in extreme heat  
A82-40439
- HANDELMAN, G. H.**  
Model of the accommodative mechanism in the human eye  
A82-39432
- HANNON, J. P.**  
Domestic swine in physiological research. 3: Blood gas and acid-base values of arterial and venous blood from young anesthetized pigs maintained under steady-state ventilatory conditions  
[AD-A111834]  
N82-28945
- HARRIS, R. L.**  
Quantification of pilot workload via instrument scan  
[NASA-CR-169238]  
N82-29900
- HARTMAN, H. B.**  
Receptors signaling gravity orientation in an insect  
A82-40668
- HARTUNG, W.**  
The effect of gravity on the distribution of plant growth substances in plant tissues  
A82-40746
- HARVEY, R. S.**  
Image orientation for RPV ground station crew  
A82-39743
- HAUGHTON, L. P.**  
The organizing of conferences  
[PB82-142696]  
N82-28948
- HAWKINS, W. W.**  
Potential applications of computer-assisted instruction to P-3 aircrew training  
[AD-A113491]  
N82-29893
- HECHT, K.**  
Biorhythms of rats during and after space flight  
A82-40692
- Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129  
A82-40737
- HEDEMARK, L. L.**  
Ventilatory and heart rate responses to hypoxia and hypercapnia during sleep in adults  
A82-41206
- HELD, R.**  
Gravity and the tilt aftereffect  
A82-39440
- HENNESSY, R. T.**  
Unconventional visual displays for flight training  
[AD-A111392]  
N82-28999
- HENRIKSEN, O.**  
Aspects of cardiovascular adaptation to gravitational stresses  
A82-40687
- The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity  
A82-40763
- HERMANT, A.**  
In-flight incapacitation and pathology for the light aircraft stunt-flyer  
A82-38851
- HEYMAN, J. S.**  
Acoustic tooth cleaner  
[NASA-CASE-LAR-12471-1]  
N82-29862
- HIDEG, J.**  
Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness  
A82-40709
- The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats  
A82-40713
- The effect of hypokinesia and hypoxia on the function of muscles  
A82-40739
- HINGHOPE-SZALKAY, H.**  
Short term gravity effects on volume homeostasis in man Assessment of transvascular fluid shifts after graded tilt  
A82-40760
- HOEKENGA, D. E.**  
Instantaneous stroke volume in man during lower body negative pressure /LBNP/  
A82-40683
- Aortic and tibial bloodflow response to lower body negative pressure /LBNP/  
A82-40727
- HOFFMAN, L. P.**  
Effect of sustained Gz acceleration on lung fluid balance - An ultrastructural study  
A82-40761
- Chronic acceleration and brain density  
A82-40769
- HOLLERBACH, J. M.**  
Workshop on the Design and Control of Dexterous Hands  
[AD-A114973]  
N82-29901
- HOPPER, J. H.**  
Thermal garment  
[NASA-CASE-XMS-03694-1]  
N82-29002
- HORDINSKY, J. R.**  
Selection and training of European astronauts  
A82-39507
- HOROWITZ, J. M.**  
Centrifuge high-g effects on temperature regulation in unanesthetized rats  
A82-40671
- Alterations in heat loss and heat production mechanisms in rat exposed to hypergravic fields  
A82-40718
- Core temperature and brainstem auditory evoked potentials as complimentary noninvasive measures of central neural function during exposure to hypergravic fields  
A82-40772
- HORSTMAN, D. H.**  
Acclimatization to dry heat: Active men versus active women  
[AD-A111708]  
N82-28993
- HORVATH, S. M.**  
Thermoregulation and the menstrual cycle  
A82-40441
- HORWITZ, B. A.**  
Centrifuge high-g effects on temperature regulation in unanesthetized rats  
A82-40671
- Alterations in heat loss and heat production mechanisms in rat exposed to hypergravic fields  
A82-40718
- IAKUSHEV, V. S.**  
The concentration of adenyl nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress  
A82-38560
- IARILIN, A. A.**  
Radiation damage and recovery of mouse T-cells. IV - Elimination of radiation-induced migration abnormalities in T-lymphocytes  
A82-38156
- IBRAIMOVA, G. I.**  
Trace reactions of the frog tissue metabolism on changes of ambient temperature in the frog Rana ridibunda Pall  
A82-40316
- IGNATOV, IU. D.**  
The anti-stress role of the gamma-aminobutyric acid system of the brain  
A82-40468

- ILCHENKO, I. D.**  
Changes of intracellular rest potential and the length of isolated muscle under different loads  
A82-40480
- ILIN, E. A.**  
Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites  
A82-40688  
Artificial gravity in space flight  
A82-40691  
Biorhythms of rats during and after space flight  
A82-40692
- ILIN, V. P.**  
The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice  
A82-38556
- ILINA-KAKUEVA, E. I.**  
Results of morphological investigations aboard biosatellites Cosmos  
A82-40697
- ILINSKIKH, N. N.**  
The circadian rhythm of the sensitivity of the chromosome apparatus of mice to the mutagenic effect of measles  
A82-40462
- ILLARIONOV, G. G.**  
Optimizing conditions for athletic activity with an allowance made for neurodynamic peculiarities /using bicycle sports as a model/  
A82-41503
- ILNITSKII, V. I.**  
Output and efficiency of the heart in young athletes as a function of the type of athletic training  
A82-41497
- INDLIN, IU. A.**  
An absolute threshold in psychoacoustics  
A82-40448
- INGS, D. M.**  
Development of a methodology for assessing aircrew workloads  
[AD-A114364]  
N82-29010
- IONTOV, A. S.**  
Age changes in the cerebral cortex of humans and cats /A comparative electron-microscopical investigation/  
A82-40496
- ISCOR, S.**  
Pulmonary stretch receptor discharge patterns in eupnea, hypercapnia, and hypoxia  
A82-41210
- ISKANDER, M. F.**  
Absorption characteristics of prolate spheroidal models exposed to the near fields of electrically small apertures  
A82-38802
- ISHAIOV, E. M.**  
Causes of high-altitude acute pulmonary edema  
A82-38167  
The cause of high-altitude acute pulmonary edema  
A82-40498
- ISHAIOV, SH. I.**  
Comparative study of systemic hemodynamics in normotensive and hypertensive rats  
A82-38542
- ISUPOV, V. G.**  
Reaction to diminished circulating blood volume in individuals who are susceptible and insusceptible to motion sickness (seasickness)  
N82-28960
- ITSEKHOVSKII, O. G.**  
Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations  
A82-39429
- IULDASHEV, K. IU.**  
Characteristics of night sleep disorders in the case of myocardial infarction according to polygraphic data  
A82-41491
- IUBATOV, E. A.**  
A factor of resistance to emotional stress in the brain of rats  
A82-40452
- IURCHENKO, O. P.**  
Two phases of the inotropic effect of adrenaline - The calcium dependence  
A82-38549
- IURENEV, A. P.**  
The influence of psychological and somatic factors on the symptomatics of hypertension  
A82-41492
- IUSKOVA, O. I.**  
The conditions attending muscular strain in work involving only a few types of movements  
A82-38569
- IVANENKO, G. P.**  
Study of the relation between the number of sulfhydryl groups and the level of lipid antioxidant activity in the organs of individual animals of different species  
A82-38153
- IVANOV, A. A.**  
Occult bacterial persistence and resistance to colonization after antibiotic therapy  
A82-40460
- IVANOV, A. V.**  
Use of the thermovision method in the prophylactic examination of polar workers  
A82-38565
- IVANOV, G. G.**  
Reactions of O-18 exchange in the myosin systems of skeletal, cardiac, and smooth muscles  
A82-38614
- IVANOV, V.**  
Monograph on new direction of chemistry and biology of peptide and protein bioregulators reviewed  
N82-28979
- IVANOV, V. I.**  
Radiation-induced shortening of the life span of *D. melanogaster*. II - Sensitizing effects of 5-bromo-2-deoxyuridine  
A82-38155
- IVANOVA, N. P.**  
Effect of the combined administration of antibiotic-resistant bifidobacteria and the corresponding antibiotics on the survival of irradiated mice  
A82-38581
- IVLEV, A. A.**  
Conditions leading to kinetic and thermodynamic isotopic effects in a cell  
A82-38601
- IVY, J. L.**  
Relationship between muscle  $Q_{O_2}$  and fatigue during repeated isokinetic contractions  
A82-41216
- J**
- JAPPE, M. J.**  
Interaction of gravitic and mechanical stimuli in tropic and nastic responses in beans  
A82-40665
- JAKAB, G.**  
Effect of immobilization on the ATPase activities and Ca-uptake of sarcoplasmic reticulum in different types of muscles  
A82-40708
- JARSUMBECK, B.**  
Intracutaneous partial oxygen pressure ( $p_{O_2}$  sub ic) in man during short-term space flights: Results of joint USSR-GDR space flight  
N82-30278
- JHABVALA, M. D.**  
Implantable electrical device  
[NASA-CASE-GSC-12560-1]  
N82-29863
- JOHNSON, C. A.**  
Effects of reference lines on displacement thresholds at various durations of movement  
A82-38797
- JOHNSON, K. A.**  
Instructor's role in individualized training: A survey of two computer managed courses  
[AD-A114917]  
N82-29894
- JONES, T. A.**  
Core temperature and brainstem auditory evoked potentials as complementary noninvasive measures of central neural function during exposure to hypergravic fields  
A82-40772

- JOO, P.  
The effect of hypoxic and hypobaric exercises on  
the blood-brain barrier in rats  
A82-40713
- JORDAN, D. P.  
Effect of simulated weightlessness on energy  
metabolism in the rat  
A82-40677
- JORDAN, J. P.  
Effect of simulated weightlessness on energy  
metabolism in the rat  
A82-40677
- JOVANOVIĆ, S.  
The radiolysis of aqueous propionitrile -  
Compounds of interest to chemical evolution  
studies  
A82-41197
- K**
- KAFIER, G.  
Gramicidin A-induced conductance of the muscle  
fiber membrane  
A82-38605
- KAKULIJA, A. G.  
The use of an audio-frequency magnetic field in  
certain diseases  
A82-41473
- KALIAZINA, N. S.  
Tritium oxide distribution and excretion kinetics  
in the exposure of animals to noise  
A82-41463
- KALITA, M. P.  
Stress in space flight - Metabolic aspects  
A82-40696  
Role of hormonal compounds in regulation of  
electrolyte metabolism in the presence of  
emotional stress  
N82-28952
- KALOSHIN, A. G.  
Conditions leading to kinetic and thermodynamic  
isotopic effects in a cell  
A82-38601
- KAMENSKIY, Y. M.  
Vibration and assessment of this flight factor by  
pilots  
N82-28976
- KANADE, T.  
Control of a direct-drive arm  
[AD-A114969]  
N82-29903
- KAPELKO, V. I.  
The rate of coronary perfusion as a factor  
determining the extent to which the contractile  
function of the heart is decreased in energy  
formation disorders  
A82-41489
- KAPLANSKII, A.  
Ultrastructural qualitative and quantitative  
evaluation of cytoplasmic structures of heart  
muscle of rats living aboard biosputnik Kosmos 936  
A82-40694
- KAPLANSKII, A. S.  
Results of morphological investigations aboard  
biosatellites Cosmos  
A82-40697
- KARANDASHOV, E. A.  
Reactions of O-18 exchange in the myosin systems  
of skeletal, cardiac, and smooth muscles  
A82-38614
- KAREL, M.  
Evaluation of engineering foods for closed  
Ecological Life Support System (CELSS)  
[NASA-CR-167626]  
N82-29003  
Evaluation of engineering foods for Controlled  
Ecological Life Support Systems (CELSS)  
[NASA-CR-166359]  
N82-29006
- KARPACHEV, A. B.  
Alterations of histochemical organization in the  
organ of Corti under the influence of chronic  
noise  
A82-39242
- KARPOV, A. M.  
Slow waves of cardiac rhythm in healthy man under  
different conditions  
N82-28955

- KASIAN, I. I.  
Investigation of the cardiovascular system during  
prolonged space flights on board the Salyut  
space stations  
A82-39429
- KASS, D. A.  
Chronic central vascular expansion induces  
hypokalemia in conscious primates  
A82-40719
- KASSIL, G. M.  
Histamine in biochemistry and physiology  
A82-39290
- KATERNOGA, M. S.  
Dynamics of the brain electric activity in  
patients with cerebral insults under the effect  
of muscle stimulation with sinusoidal modulated  
currents  
A82-41477
- KAUFMAN, P. B.  
Gravity perception and asymmetric growth in plants  
- A model derived from the grass pulvinus  
A82-40775
- KAVERINA, N. V.  
The effect of diethylamine analog of ethmazine on  
the functional condition of myocardium /Clinical  
and experimental study/  
A82-41488
- KAZYMBETOV, P.  
Attenuation of radioprotective effects of acute  
hypoxia on animals adapted to high altitudes  
N82-29855
- KEIL, L. C.  
Bone growth and composition in weanling and mature  
rats exposed to chronic centrifugation  
A82-40669
- KELLER, V. S.  
Certain psychological and tactical aspects of  
athlete activities during competitions  
A82-41506
- KENNEDY, R. S.  
Visual Technology Research Simulator (VTRS) human  
performance research: Phase 3  
[AD-A112475]  
N82-28988
- KENNER, T.  
Analysis of transient cardiovascular response to  
orthostatic stress using noninvasive methods  
A82-40740  
Short term gravity effects on volume homeostasis  
in man Assessment of transvascular fluid shifts  
after graded tilt  
A82-40760
- KESSLER, J. O.  
Gravity sensing, polar transport and cytoplasmic  
streaming in plant cells  
A82-40667
- KHALIGH, S.  
Effects of lower body negative pressure on the  
reliability of cardiovascular system using X-ray  
kymograms  
A82-40728
- KHANIN, I. U.  
Adapting a scale for measuring competition anxiety  
A82-40450
- KHAVINSON, V. KH.  
Experimental and clinical study of a new  
immunoregulatory preparation - thymalin  
A82-38177
- KHELNITSKII, O. K.  
Histochemical changes in experimental animals  
exposed to variable noise  
A82-38577
- KHOLSKAIA, A.  
Sword and scalpel  
A82-38564
- KHONICHEVA, N. M.  
Vegetative reactions to the administration of  
atropine and propranolol in rats that exhibit  
different types of behavior  
A82-40463
- KHOROZHAEV, V. A.  
The response of the venous walls in the  
extremities to a disturbed venous outflow  
A82-40493
- KHOTIMCHENKO, S. A.  
Energy requirements of workers at an oil field in  
western Siberia  
A82-40481

- KHUGAIEVA, V. K.**  
The effect of leienkephalin and thyrosine on the lymphatic and blood microvessels  
A82-41490
- KIIATKIN, E. A.**  
Statistical analysis of neuronal impulse activity in the diencephalon during immobilization-produced emotional stress in rats  
A82-40467
- KIM, D. H.**  
Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle  
A82-41209
- KIM, IU. A.**  
The mechanism of the microwave effect on the conductivity of bilayer lipid membranes  
A82-38587
- KIMMEL, K.**  
The ranking of displays based on transinformation [PB-52]  
N82-29001
- KIRDEI, E. G.**  
The effect of products erythrocyte destruction on immunological processes  
A82-40500
- KIRSCH, K.**  
Methodological aspects of future cardiovascular research in space  
A82-40652  
ADH suppression under immersion combined with dehydration  
A82-40776
- KIRKON, S. S.**  
Functional properties of T-lymphocytes in patients with acute myocardial infarction  
A82-41459
- KISS, Z.**  
Effect of immobilization on the nonhistone protein composition in different types of skeletal muscles  
A82-40711  
Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization  
A82-40742
- KLEIN, H. P.**  
Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129  
A82-40698
- KLEIN, K. E.**  
Selection and training of European astronauts  
A82-39507
- KLEITZ, C.**  
Anatomy of the spine  
N82-29871  
Biomechanics of the spine  
N82-29872  
The spine and fitness for flight  
N82-29889
- KLIMENKO, A. I.**  
Physiological and hygienic analysis of the response of young truck drivers to their work load  
A82-38567
- KLIMOV, A. N.**  
A measurement of the size distribution of lipoproteins in the plasma of human blood  
A82-38603
- KLIMOVITSKII, V. IA.**  
Biorhythms of rats during and after space flight  
A82-40692  
Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129  
A82-40737
- KLING, D.**  
Aging and visual function of military pilots - A review  
A82-40435
- KLISHOV, A. A.**  
Myosatelloocytes and cambial properties of skeletal and muscular tissue  
A82-41469
- KLYUCHANSKAYA, N. V.**  
Methodological aspects of testing erythrocyte balance by counting incubated reticulocytes  
N82-28972
- KNIAZEV, D. A.**  
Conditions leading to kinetic and thermodynamic isotopic effects in a cell  
A82-38601
- KNIAZEVA, G. D.**  
The ultrastructure of the myocardium in the restorative period following aorto-coronary shunting in patients with chronic ischemic heart disease  
A82-41484
- KOCHERLAKOTA, R. R.**  
Ambiguity and the evolution of the genetic code  
A82-38120
- KOGAN, A. KH.**  
Enzymes that detoxify active forms of oxygen and lipoperoxide in experimental ischemia and myocardial infarction  
A82-38540
- KOHL, R. L.**  
Neurochemical background and approaches in the understanding of motion sickness [NASA-CR-3569]  
N82-29865
- KOKHANOVA, N. A.**  
The effect of certain characteristics of work motions on the tolerance of hand muscles to static exertions  
A82-38568
- KOLEDENOK, V. I.**  
Diagnostics of disturbances of heart rhythm and conductance and their professional evaluation in flight personnel  
A82-40309
- KOLOSOVA, F. A.**  
The effect of certain characteristics of work motions on the tolerance of hand muscles to static exertions  
A82-38568
- KONDRAKOV, V. M.**  
Diagnostics of disturbances of heart rhythm and conductance and their professional evaluation in flight personnel  
A82-40309
- KONDRATSKII, A. A.**  
A test for the prediction of risk-taking attitude in operators  
A82-40449
- KONONOVA, V. A.**  
Study of RNA synthesis rate and DNA content in the myocardium of new-born rats during adaptation to high-altitude hypoxia  
A82-38537
- KONOVALOV, G. V.**  
Changes in neurons of the spinal cord and spinal ganglia under hypokinesia /neuromorphological and histochemical investigation/  
A82-40494
- KONOVALOVA, G. G.**  
Enzymes that detoxify active forms of oxygen and lipoperoxide in experimental ischemia and myocardial infarction  
A82-38540
- KONRADOV, A. A.**  
Study of the relation between the number of sulfhydryl groups and the level of lipid antioxidant activity in the organs of individual animals of different species  
A82-38153
- KONUSOVA, A. V.**  
The effect of serotonin on the development of acute hyperthermia in rats  
A82-38583
- KORETZ, J. F.**  
Model of the accommodative mechanism in the human eye  
A82-39432
- KORNEV, A. N.**  
Proof of the existence of Ca<sup>2+</sup>-induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles  
A82-38599
- KORNIYENKO, V. N.**  
Regulation of cerebral circulation in erect position  
N82-28957
- KOROCHKIN, I. M.**  
Functional properties of T-lymphocytes in patients with acute myocardial infarction  
A82-41459

- KOROLKOV, V. I.  
Artificial gravity in space flight  
A82-40691
- KOROVNIKOV, K. A.  
Physical activity and human requirements for  
energy and food substances  
A82-40487
- KORSHUNOV, V. M.  
Effect of the combined administration of  
antibiotic-resistant bifidobacteria and the  
corresponding antibiotics on the survival of  
irradiated mice  
A82-38581
- KORZENSZKY, L.  
Labyrinth plugging as a model of suspended  
vestibular sensory input  
A82-40721
- KOSHELEV, N. P.  
The effectiveness of perspiration in a hot  
environment  
A82-38178
- KOSITSKII, G. I.  
The impulse activity of neurons in the nodose  
ganglion during acute hemodynamic and  
respiratory disorders  
A82-38546
- KOSYKH, V. A.  
RNA-content distribution of cells from the normal  
and atherosclerotic human aorta  
A82-38535
- KOTELNIKOV, V. M.  
Separation of bone marrow cells in mice by  
free-flow electrophoresis  
A82-38536
- KOTER, Z.  
Rhythms of electrolytes and hydroxyproline  
excretion in urine of rats after three weeks of  
weightlessness - Biosatellite Cosmos-1129  
A82-40693
- KOTOVSKAIA, A. B.  
Artificial gravity in space flight  
A82-40691
- KOTOVSKAYA, A. B.  
Endurance of +Gz G forces by middle-aged people  
before and after 7-day immersion  
N82-28958  
Efficacy of kavinton in prevention of motion  
sickness  
N82-28961  
Preparation of labyrinthectomized animals for  
flight aboard Cosmos-936 biosatellite  
N82-28971
- KOVALCHUK, L. P.  
The effect of laser radiation on lipid synthesis  
in yeast  
A82-38585
- KOVALENKO, E. A.  
Intracutaneous partial oxygen pressure (pO<sub>2</sub> sub  
ic) in man during short-term space flights:  
Results of joint USSR-GDR space flight  
N82-30278
- KOVALENKO, N. A.  
A factor of resistance to emotional stress in the  
brain of rats  
A82-40452
- KOVALEV, V. V.  
The potential of radionuclide diagnosis of acute  
myocardial infarction  
A82-41458
- KOVALEVSKAIA, A. L.  
Enzymes that detoxify active forms of oxygen and  
lipoperoxide in experimental ischemia and  
myocardial infarction  
A82-38540
- KOWALSKI, W.  
Some of biochemical parameters in rat brain during  
+Gz acceleration  
A82-40717
- KOZERENKO, O. P.  
Results of investigations of weightlessness  
effects during prolonged manned space flights  
onboard Salyut-6  
A82-40750
- KOZHECHKIN, S. N.  
The cholinergic nature of hypothalamo-cortical  
excitatory influence  
A82-38551
- KOZHOKARU, A. F.  
A comparison between the protonophoric and  
separating functions of weak dibasic acids  
A82-38590
- KOZINETZ, G. I.  
Separation of bone marrow cells in mice by  
free-flow electrophoresis  
A82-38536
- KOZLOV, G. D.  
A device for producing the action of static  
magnetic fields on biological objects  
A82-41482
- KOZLOVA, T. D.  
A study of temporary absences from work arising  
from disorders of the circulatory system  
A82-38555
- KOZLOVSKAIA, I. B.  
Mechanisms of the effects of weightlessness on the  
motor system of man  
A82-40752
- KOZLOWSKI, S.  
Skin temperature and thermal comfort in  
weightlessness  
A82-40726
- KRASHENKOV, V. I.  
A study of temporary absences from work arising  
from disorders of the circulatory system  
A82-38555
- KRASHNIKOV, V. E.  
The microcirculatory bed of the lungs after an  
effect exerted on the right vagus nerve  
A82-40497
- KRASOVSKAIA, I. B.  
Reactions of O-18 exchange in the myosin systems  
of skeletal, cardiac, and smooth muscles  
A82-38614
- KRAUKLIS, A. A.  
Phase analysis of dynamics of galvanic skin  
responses in man  
N82-29861
- KREIDICH, I. V.  
Mechanisms of the effects of weightlessness on the  
motor system of man  
A82-40752
- KRIBS, H. D.  
Potential applications of computer-assisted  
instruction to P-3 aircrew training  
[AD-A113491]  
N82-29893
- KRIKORIAN, A. D.  
Morphogenesis of a higher plant from cultured  
cells and embryos in space  
A82-40666
- KRITSKII, G. A.  
Changes in the relations of pyrimidine blocks in  
DNA of the hematopoietic system immediately  
following gamma irradiation of the animal  
A82-38152
- KRIUKOVA, D. N.  
The conditions attending muscular strain in work  
involving only a few types of movements  
A82-38569
- KRIVUNCHENKO, V. P.  
The detection of premorbid states and  
cardiovascular diseases during medical  
examinations of seamen  
A82-38553
- KROENENBERG, R. S.  
Ventilatory and heart rate responses to hypoxia  
and hypercapnia during sleep in adults  
A82-41206
- KROPACOVA, K.  
Effects of space flight factors and artificial  
gravity on deoxyribonucleoprotein in lymphoid  
organs of rats  
A82-40723
- KROPIVKO, S. G.  
The conditions attending muscular strain in work  
involving only a few types of movements  
A82-38569
- KRUGLIKOV, R. I.  
Neurochemical mechanisms of learning and memory  
A82-40646
- KRUPINA, T. N.  
Endurance of +Gz G forces by middle-aged people  
before and after 7-day immersion  
N82-28958

- KRYLOV, S. S.**  
Biochemical aspects of the mechanism by which  
cholinolytics affect the brain  
A82-41468
- KRYZHANOVSKII, G. N.**  
Alterations in heart work rhythm during  
hyperactivation of the anterior amygdaloid nucleus  
A82-38545  
The effect of hyperactivation of the anterior  
amygdaloid nucleus on heart activity during  
states of altered reactivity  
A82-40454
- KUCHERENKO, N. B.**  
Effects of cAMP accumulation activators on certain  
stages of genome expression in cells upon acute  
radiation damage to the organism. III  
Comparative study of the properties of RNA  
synthesized in a system of isolated liver and  
spleen cell nuclei from irradiated rats and  
animals having been treated with serotonin prior  
to irradiation  
A82-38157
- KUCHERENKO, N. G.**  
Study of the radioprotective effectiveness of an  
hypoxic gas mixture during combined radiation  
and thermal injuries to rats  
A82-38159
- KUDRIASHOV, B. B.**  
The microflora of the central Antarctica glacier  
and control methods for the sterile isolation of  
an ice core for microbiological analyses  
A82-39430
- KUDRIN, A. N.**  
Enzymes that detoxify active forms of oxygen and  
lipoperoxide in experimental ischemia and  
myocardial infarction  
A82-38540
- KUHN, H.**  
Evolution of early mechanisms of translation of  
genetic information into polypeptides  
A82-41324
- KUINOV, A. D.**  
The rate at which exogenous hydrocortisone is  
eliminated from peripheral blood flow in  
patients suffering from an acute myocardial  
infarction  
A82-41498
- KUJAWA, M.**  
Ultrastructural qualitative and quantitative  
evaluation of cytoplasmic structures of heart  
muscle of rats living aboard biosputnik Kosmos 936  
A82-40694
- KULAGIN, V. K.**  
Migration kinetics of hemopoietic stem cells in  
mice after severe mechanical trauma  
A82-38541
- KULESHOVA, T. F.**  
Afferent associative and commissural projections  
of the cortical vestibular zone VI of cats  
A82-40495
- KULEVA, N. V.**  
Reactions of O-18 exchange in the myosin systems  
of skeletal, cardiac, and smooth muscles  
A82-38614
- KULIKOV, M. A.**  
Intrahemispherical relations of EEG slow-wave  
components in patients with local brain lesions  
A82-40472
- KUPATADZE, R. M.**  
The effect of monovalent cations on the ATPase  
activity and superprecipitation of actomyosin  
A82-38615
- KUPRIN, S. P.**  
Changes in man's constant electric field in the  
course of adaptation to hypokinesia  
A82-38595
- KURKINA, I. M.**  
Nitrogen compound levels in tissues of rat  
cerebral hemispheres and cerebellum after flight  
aboard Cosmos-1129 biosatellite  
A82-28967
- KUSTOV, V. V.**  
The combined effect of carbon monoxide and  
total-body vibration on the organism  
A82-40475
- KUVSHINOVA, R. L.**  
Diagnosis and organization of the therapy of  
patients with disorders of blood circulation in  
the brain  
A82-38554
- KUZAY, T. M.**  
OTEC-1 power system test program: Biofouling and  
corrosion monitoring on OTEC-1  
[DB82-007035]  
A82-29851
- KUZDENBAEVA, R. S.**  
The effect of potassium orotate on the metabolism  
of certain vitamins in patients with fractures  
of the long tubular bones  
A82-38563
- KUZIN, A. M.**  
Changes in electrically neutral Ca<sup>2+</sup>/H<sup>+</sup> exchange in rat liver mitochondria following  
gamma irradiation  
A82-38151
- KUZHENKO, D. I.**  
The role of nutrition in the changes of energy  
metabolism during stress  
A82-40482
- KUZHENKO, G. N.**  
Modification of method for assaying ozone by the  
diacetyl dihydrolutidine reaction  
A82-28973
- KUZNETSOV, A. N.**  
The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase  
A82-38591
- KUZNIK, B. I.**  
Evidence of an immune mechanism of  
enzyme-hemostasis regulation  
A82-38552
- KVETNANSKY, R.**  
Stress in space flight - Metabolic aspects  
A82-40696
- KWARECKI, K.**  
Rhythms of electrolytes and hydroxyproline  
excretion in urine of rats after three weeks of  
weightlessness - Biosatellite Cosmos-1129  
A82-40693  
Some of biochemical parameters in rat brain during  
+Gz acceleration  
A82-40717
- KWETNIANSKI, R.**  
Catecholamines and enzymes of their metabolism in  
rat myocardium after flight aboard the  
Cosmos-936 biosatellite  
A82-28966
- L**
- LACKNER, J. E.**  
Rapid perceptual adaptation to high  
gravito-inertial force levels Evidence for  
context-specific adaptation  
A82-40436
- LAKHTAKIA, A.**  
Absorption characteristics of prolate spheroidal  
models exposed to the near fields of  
electrically small apertures  
A82-38802
- LAMBERT, E. H.**  
Involuntary and voluntary mechanisms for  
preventing cerebral ischemia due to positive  
/Gz/ acceleration  
A82-40747
- LANDY, P. J.**  
Adaptive motivation theory  
[AD-A111195]  
A82-28997
- LANGE, D.**  
Mode of mutual influence of  
stimulation-characteristics in the visual  
processing system  
A82-41445
- LANIADO, M.**  
ADH suppression under immersion combined with  
dehydration  
A82-40776
- LANKIN, V. Z.**  
Enzymes that detoxify active forms of oxygen and  
lipoperoxide in experimental ischemia and  
myocardial infarction  
A82-38540

- LAPAEV, E. V.**  
Evaluation of vestibular function in flight personnel with chronic diseases during stable remission  
A82-38179
- LATEGOLA, M. T.**  
Alcohol-induced physiological displacements and their effects on flight related functions  
[AD-A114919] A82-29867
- LATSKEVICH, A. A.**  
Metabolic distinctions related to intake of low-calorie 'survival' rations consisting only of readily assimilated carbohydrates  
A82-28953
- LAUGHLIN, M. H.**  
The effects of +G2 acceleration stress on right ventricular pressures in conscious miniature swine.  
The effect of G sub z acceleration on pulmonary perfusion in the miniature swine  
A82-40676  
A82-40681
- LAVERNHE, J.**  
The nature and rate of occurrence of medical emergencies on board Air France aircraft  
A82-38841
- LAURENTEV, V. V.**  
An investigation of the conformational stability of immunoglobulin G in the monolayers at the phase boundary between aqueous solutions of NaCl and octane  
A82-38607
- LEACH, C. S.**  
Computer simulations of postural change, water immersion and bedrest - An integrative approach for understanding the spaceflight response  
Dynamics of weight loss during prolonged spaceflight  
A82-40659  
A82-40673
- LEDNEV, V. V.**  
Proof of the existence of Ca<sup>2+</sup>-induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles  
A82-38599
- LEDOUX, P.**  
Medical emergencies on board airliners - Procedures in the absence of a doctor  
A82-38845
- LEGER, A.**  
Medico-physiological aspects of stunt-flying  
Vestibular screening of cosmonauts  
Parachuting  
A82-38849  
A82-38853  
A82-29878
- LEGUAY, G.**  
Medical emergencies in flight - Pathogenic aspects  
Clinical examination of spinal injuries  
The spine and fitness for flight  
A82-38843  
A82-29882  
A82-29889
- LEHTO, M. L.**  
Development of a methodology for assessing aircrew workloads  
[AD-A114364] A82-29010
- LEISSOO, A. R.**  
The significance of postextrasystolic potentiation in the preoperative assessment of the reversal of left-ventricle asynergy in patients with ischemic heart disease  
A82-41483
- LELAIE, C.**  
Aerobatics in light aircraft - Sensations and stresses experienced by the pilot  
A82-38848
- LENNON, R. M.**  
The radiolysis and racemization of leucine on proton irradiation  
A82-38118
- LEONARD, J. I.**  
Computer simulations of postural change, water immersion and bedrest - An integrative approach for understanding the spaceflight response  
Dynamics of weight loss during prolonged spaceflight  
A82-40659  
A82-40673
- LEVASHOV, M. M.**  
Nystagmometry of optovestibular interaction  
A82-28962
- LEVITSKII, D. I.**  
Acridine orange inhibition of the ATPase activity of myosin and its fragments  
A82-38613
- LEWIS, R. J.**  
Ligation of oligonucleotides by pyrimidine dimers - A missing 'link' in the origin of life  
A82-39423
- LIACH, IU. E.**  
Physiological and hygienic analysis of the response of young truck drivers to their work load  
A82-38567
- LIAMIN, V. E.**  
Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations  
A82-39429
- LIBERMAN, E. A.**  
Ion currents through a neuron membrane during the injection of cyclic nucleotides  
A82-38588
- LIPANTEV, V. I.**  
Functional condition of the heart mitochondria in the dynamics of emotional and pain stress  
A82-41500
- LIKHTENSHTEIN, V. A.**  
The thermal pulsation method in the study of several physiological mechanisms of the brain stem  
Thermal pulsation - Techniques, demonstration, and clinical application  
A82-38559  
A82-41474
- LILLEY, M. D.**  
Is the CH<sub>4</sub>, H<sub>2</sub> and CO venting from submarine hydrothermal systems produced by thermophilic bacteria  
A82-39422
- LIMBACH, L.**  
Biomedical research publications: 1980 - 1982  
[NASA-CR-3587] A82-29848
- LIN, C. Y.**  
Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129  
A82-40698
- LINTERN, G.**  
Visual Technology Research Simulator (VTRS) human performance research: Phase 3  
[AD-A112475] A82-28988  
Unconventional visual displays for flight training  
[AD-A11392] A82-28999
- LIPENKOV, V. IA.**  
The microflora of the central Antarctica glacier and control methods for the sterile isolation of an ice core for microbiological analyses  
A82-39430
- LISENKOV, A. M.**  
Selecting optimal conditions for heart conservation in weak aldehyde solutions by using mathematical methods of experimental design  
A82-38534
- LITAU, V. G.**  
The combined effect of carbon monoxide and total-body vibration on the organism  
A82-40475
- LITSOV, A. M.**  
Sleep, circadian cycles of physiological functions and parameters of human work capacity on first day after changing from altered to usual sleep-waking cycle  
A82-28951
- LITVIN, P. F.**  
Light curves for photosynthesis under intermittent illumination  
A82-38608
- LITVINENKOVA, P. V.**  
Postural control related to the different tilting body positions  
A82-40732
- LIU, C.**  
Altered bone turnover during spaceflight  
A82-40679

- LLYKHIN, A. V.  
Methodological aspects of testing erythrocyte  
balance by counting incubated reticulocytes  
N82-28972
- LOBACHEVA, I. I.  
Serotonin content of peripheral organs and tissues  
in rats under normal conditions and under stress  
during postnatal development  
A82-38584
- LOBAN, G. A.  
Features of microcirculatory hemostasis and of the  
clotting and fibrinolytic properties of blood  
and the activity of the antioxidant system in  
people of various ABO blood groups  
A82-38164
- LOEPKY, J. A.  
Instantaneous stroke volume in man during lower  
body negative pressure /LBNP/  
A82-40683  
Aortic and tibial bloodflow response to lower body  
negative pressure /LBNP/  
A82-40727  
Reduction in renal artery blood flow impedance  
during upright tilt in man  
A82-40735
- LOZINSKIY, P. A.  
Metabolic distinctions related to intake of  
low-calorie 'survival' rations consisting only  
of readily assimilated carbohydrates  
N82-28953
- LUD, G. V.  
Sources of an artificial magnetic field for  
implantation /experimental study/  
A82-41480
- LUFT, U. C.  
Instantaneous stroke volume in man during lower  
body negative pressure /LBNP/  
A82-40683
- LUKHA, O. A.  
The significance of postextrasystolic potentiation  
in the preoperative assessment of the reversal  
of left-ventricle asynergy in patients with  
ischemic heart disease  
A82-41483
- LUND, D. D.  
Metabolic and cardiovascular adaptations in  
trained hypophysectomized rats  
A82-41215
- LURIA, S. M.  
Cold weather goggles. 2: Performance evaluation  
[AD-A114067]  
N82-29008
- LUTAI, M. I.  
The amplitude of the R wave and the contractile  
function of the left ventricle in patients with  
ischemic heart disease  
A82-41486
- LUTCHEN, K. R.  
A nonlinear model combining pulmonary mechanics  
and gas concentration dynamics  
A82-41230
- LUTS, L. L.  
The use of electrovacuum therapy in certain  
diseases of the peripheral nervous system  
A82-41478
- LYNE, P. J.  
Alcohol-induced physiological displacements and  
their effects on flight related functions  
[AD-A114919]  
N82-29867
- LYSOGOR, N. A.  
Diagnostics of disturbances of heart rhythm and  
conductance and their professional evaluation in  
flight personnel  
A82-40309
- M
- MABEL, J. A.  
Nutrition and food technology for a Controlled  
Ecological Life Support System (CELSS)  
[NASA-CR-167392]  
N82-29004
- MACDOUGALL, J. D.  
Neuromuscular adaptation in human thenar muscles  
following strength training and immobilization  
A82-41213
- MACHO, L.  
Stress in space flight - Metabolic aspects  
A82-40696
- MACKINLAY, A. G.  
Polynucleotide replication coupled to protein  
synthesis A possible mechanism for the origin of  
life  
A82-38119
- MADENIA-PYRGAKI, A.  
The effects of human growth hormone administration  
on the functional status of rat atrophied muscle  
following immobilization  
A82-40715
- MAGEDOV, V. S.  
Relation between sensoric and motoric function of  
Wistar rats after space flight by biosatellite  
Cosmos 1129  
A82-40737
- MAGER, H.  
Hypo- and hyperglycemia in rats: Effects on the  
ability to work in the heat  
[AD-A111711]  
N82-29849
- MAINS, R. C.  
Cardiovascular responses of the chronically  
instrumented monkey during simulated space flight  
A82-40670
- MAKAROV, F. N.  
Afferent associative and commissural projections  
of the cortical vestibular zone VI of cats  
A82-40495
- MAKAROV, I. N.  
Robotics: Problems and prospects  
A82-40473
- MAKSINOV, D. G.  
Reaction to diminished circulating blood volume in  
individuals who are susceptible and  
insusceptible to motion sickness (seasickness)  
N82-28960
- MAKSINOV, V. N.  
Study of the relation between the number of  
sulfhydryl groups and the level of lipid  
antioxidant activity in the organs of individual  
animals of different species  
A82-38153
- MALACINSKI, G. M.  
The intracellular responses of frog eggs to novel  
orientations to gravity  
A82-40758
- MALEV, V. V.  
Granacidin A-induced conductance of the muscle  
fiber membrane  
A82-38605
- MALINCHIK, S. B.  
Proof of the existence of Ca<sup>2+</sup>-induced  
structural changes in stems of myosin-containing  
filaments of vertebrate skeletal muscles  
A82-38599
- MALTSEV, V. N.  
Effect of the combined administration of  
antibiotic-resistant bifidobacteria and the  
corresponding antibiotics on the survival of  
irradiated mice  
A82-38581
- MALTSEVA, N. V.  
Characteristics of human auditory evoked  
potentials during the lateralization of a  
'moving' auditory image  
A82-40465
- MALYSHEV, V. V.  
Functional condition of the heart mitochondria in  
the dynamics of emotional and pain stress  
A82-41500
- MANONTOVA, I. P.  
A measurement of the size distribution of  
lipoproteins in the plasma of human blood  
A82-38603
- MANSSON, A.  
Vestibular effects of water immersion and Clonidine  
A82-40762
- MANUKIAN, K. G.  
The conductivity of model protein-lipid membranes  
A82-38604
- MANYKIN, E. A.  
Determination of blood-lipoprotein dimensions by  
optical methods  
A82-38593
- NARDASHKO, A. A.  
State of the lactate dehydrogenase reaction in the  
muscular tissue of irradiated animals  
A82-38158



- HARIKIAN, G. G.  
Temperature characteristics of the  
ouabain-insensitive sodium flux in frog muscles  
A82-38600
- HARK, L. J.  
Potential applications of computer-assisted  
instruction to P-3 aircrew training  
[AD-A113491] A82-29893
- HARKIN, A. S.  
Preparation of labyrinthectomized animals for  
flight aboard Cosmos-936 biosatellite  
A82-28971
- HARKOV, KH. M.  
The content of cAMP and cGMP in brain tissues  
during adaptation to ischemia  
A82-40310
- HARKOVA, E. A.  
The effect of hypokinesia on the resistance of the  
heart to hypoxia  
A82-38170  
The effect of hypokinesia on the resistance of the  
heart to hypoxia  
A82-40502
- HARKOVA, Z. A.  
Diagnosis and organization of the therapy of  
patients with disorders of blood circulation in  
the brain  
A82-38554
- MARTIN, L. G.  
Altitude-induced changes in plasma thyroxine,  
3,5,3 prime-triiodothyronine, and thyrotropin in  
rats  
A82-41207
- MARTINOVICH, P. N.  
Approaches to the study of the  
hypothalamus-pituitary gland relationship  
A82-39569
- MARTONE, J. A.  
An industrial hygiene evaluation of aircraft  
refueling inside closed aircraft shelters at  
elevated ambient temperatures  
[AD-A114396] A82-28994
- MARTYNOV, A. A.  
The ultrastructure of the myocardium in the  
restorative period following aorto-coronary  
shunting in patients with chronic ischemic heart  
disease  
A82-41484
- MASSON, J. M.  
Standards of physical condition for private pilots  
of aircraft and gliders  
A82-38847
- MASSOUDI, M.  
Absorption characteristics of prolate spheroidal  
models exposed to the near fields of  
electrically small apertures  
A82-38802
- MATEEV, G.  
The influence of a deficit of vitamins on immunity  
/A review of the literature/  
A82-41504
- MATTHES, R. D.  
Metabolic and cardiovascular adaptations in  
trained hypophysectomized rats  
A82-41215
- MATVEEVA, N. A.  
An investigation of the conformational stability  
of immunoglobulin G in the monolayers at the  
phase boundary between aqueous solutions of NaCl  
and octane  
A82-38607
- MAX, S. R.  
Testosterone enhances C-14 2-deoxyglucose uptake  
by striated muscle  
[NASA-CR-169101] A82-28986
- MAXWELL, B. D.  
Relationship between muscle  $\text{O}_2$  and fatigue during  
repeated isokinetic contractions  
A82-41216
- MAZANOV, G. S.  
A study of temporary absences from work arising  
from disorders of the circulatory system  
A82-38555
- MAZAREAN, H.  
Immobilization effects upon aerobic and anaerobic  
metabolism of the skeletal muscles  
A82-40712
- MCCOMAS, A. J.  
Neuromuscular adaptation in human thenar muscles  
following strength training and immobilization  
A82-41213
- MCCREA, J.  
Chemical evolution. XL - Clay-mediated oxidation  
of diaminomaleonitrile  
A82-41196
- MCCUTCHEON, E. P.  
Cardiovascular responses of the chronically  
instrumented monkey during simulated space flight  
A82-40670
- MCHEDLISHVILI, G. I.  
The influence of the speed of blood flow in the  
carotid artery on the hematocrit of the blood  
being delivered to the brain  
A82-38550
- MCHAHON, T. A.  
Gravitational scale effects  
A82-40650  
Running in circles  
A82-40661
- MEDELIAHOVSKII, A. M.  
Systemic mechanisms of homeostasis  
A82-39417
- MEDVEDEV, B. I.  
Changes in electrically neutral  $\text{Ca}^{2+}$ -H $^{+}$  exchange in rat liver mitochondria following  
gamma irradiation  
A82-38151
- MEDVEDEV, O. S.  
Comparative study of systemic hemodynamics in  
normotensive and hypertensive rats  
A82-38542
- MEERSON, P. Z.  
Prevention of heart function abnormalities during  
reoxygenation after ischemia by adaptation to  
altitude hypoxia  
A82-40455
- MEERSON, V. Z.  
Functional condition of the heart mitochondria in  
the dynamics of emotional and pain stress  
A82-41500
- MEETER, E.  
The consequences of hydrazine exposition and its  
treatment  
[MBL-1981-2] A82-28996
- MEKHILANE, L. S.  
An attempt at the classification of 'patient  
pharmacokinetic capacities'  
A82-38562
- MELIKISHVILI, M. M.  
The use of an audio-frequency magnetic field in  
certain diseases  
A82-41473
- MELOIAN, V. G.  
The speed of blood flow in athletes subjected to  
the combined action of a training regime and  
high-altitude climatic factors  
A82-41505
- MESHALKIN, IU. P.  
The temperature dependence of the H-1 NMR spectrum  
of hydrated collagen  
A82-38611
- MESHKOVA, M. M.  
Orienting and exploratory behavior of gray rat in  
open field. Zoopsychological analysis  
A82-28981
- MESZAROS, M. G.  
Plasticity of fast and slow muscle myofibrillar  
proteins in model experiments simulating  
weightlessness  
A82-40709
- METGES, P. J.  
Theories of the pathogenesis of fractures of the  
spine  
A82-29874  
Radiology of spinal trauma in aviation medicine  
A82-29883  
Sequelae of vertebral fractures and trauma  
A82-29886  
Backache in helicopter pilots  
A82-29887  
The spine and fitness for flight  
A82-29889
- METZ, K. F.  
Effect of induced erythrocythemia on hypoxia  
tolerance during physical exercise  
A82-41218

- MEZEI, Z.**  
The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats  
A82-40713
- NICHEL, C.**  
Human lymphocyte activation is depressed at low-g and enhanced at high-g  
A82-40658
- NIKHLADZE, Z. A.**  
The dynamics of quantitative changes of RNA in rat cerebellum Purkinje cells in different functional states  
A82-38538
- NIKHAILIUK, I. A.**  
The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension  
A82-40477
- NIKHAILOVA, S. D.**  
The impulse activity of neurons in the nodose ganglion during acute hemodynamic and respiratory disorders  
A82-38546
- NILAEVA, V. A.**  
The rate at which exogenous hydrocortisone is eliminated from peripheral blood flow in patients suffering from an acute myocardial infarction  
A82-41498
- NILHAUD, A.**  
In-flight incapacitation and pathology for the light aircraft stunt-flyer  
A82-38851
- NILLEE, J. M.**  
Relationship between muscle  $\text{O}_2$  and fatigue during repeated isokinetic contractions  
A82-41216
- MININA, S. V.**  
Ion currents through a neuron membrane during the injection of cyclic nucleotides  
A82-38588
- MIRONOV, A. I.**  
The conditions attending muscular strain in work involving only a few types of movements  
A82-38569
- MIRONOV, G. P.**  
The flavin-dependent consumption of oxygen in mitochondria under illumination  
A82-38589
- MIROSHNICHENKO, M. S.**  
A new hypothesis for the mechanism of muscle contraction  
A82-41334
- MIROSHNIKOV, A.**  
Monograph on new direction of chemistry and biology of peptide and protein bioregulators reviewed  
N82-28979
- MISUROVA, E.**  
Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats  
A82-40723
- MITARAI, G.**  
Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration  
A82-40720
- MITKIN, A. A.**  
Current problems concerning the vestibulo-ocular interaction  
A82-39416
- MITRANI, L.**  
Retinal location and visual localization during pursuit eye movement  
A82-39436
- MITSENKO, M. D.**  
The use of biochemical monitoring methods in the ergometry of patients with atherosclerosis  
A82-41494
- MIZUNO, Y.**  
Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration  
A82-40720
- MOCKEE, R.**  
Initial audiometric investigations in an orbital station  
N82-30277
- MOHLER, S. B.**  
Flight crewmember workload evaluation [AD-A114167]  
N82-29012
- MOHRI, T.**  
Formation of cyanate and carbamyl phosphate by electric discharges of model primitive gas  
A82-38116
- MOIKIN, I. V.**  
The conditions attending muscular strain in work involving only a few types of movements  
A82-38569
- MOISEVA, L. A.**  
Participation of the prefrontal cortex in delayed spatial choice and differentiation of time intervals in rhesus monkeys  
A82-40470
- MOISEVA, L. M.**  
Abiogenic synthesis of the peptide bond. II  
A82-39426  
Abiogenic synthesis of the peptide bond. I  
A82-39448
- MOKROUSOVA, A. V.**  
Preparation of labyrinthectomized animals for flight aboard Cosmos-936 biosatellite  
N82-28971
- MONTASTRUC, P.**  
Effects of prolonged bedrest in antiorthostatic position on rCBF measured by  $^{133}\text{Xe}$  inhalation technique - Effects of clonidine  
A82-40743
- MOONAN, W. J.**  
On models and methods for performance measurement [AD-A113578]  
N82-28998
- MOORE-BDE, M. C.**  
Rotating shift work schedules that disrupt sleep are improved by applying circadian principles  
A82-38325  
Chronic central vascular expansion induces hypokalemia in conscious primates  
A82-40719
- MOORE, E. K.**  
Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating  
A82-38795
- MOORES, W. Y.**  
Domestic swine in physiological research. 3: Blood gas and acid-base values of arterial and venous blood from young anesthetized pigs maintained under steady-state ventilatory conditions [AD-A111834]  
N82-28945
- MOORHEAD, I. R.**  
Discrimination and detection thresholds - The effect of observer criterion on the spatial properties of chromatic and achromatic mechanisms  
A82-39438
- MOREY HOLTON, E.**  
Bone resorption and calcium absorption in rats during spaceflight  
A82-40704
- MOREY-HOLTON, E.**  
Animal models for simulating weightlessness  
A82-40749
- MOREY, E. R.**  
A new rat model simulating some aspects of space flight  
A82-40655  
Altered bone turnover during spaceflight  
A82-40679  
Effect of space flight on bone strength  
A82-40680  
Atrophy of rat skeletal muscles in simulated weightlessness  
A82-40738  
Suppression of osteoblast differentiation during weightlessness  
A82-40756  
Evidence for arrested bone formation during spaceflight  
A82-40767  
Skeletal abnormalities in rats induced by simulated weightlessness  
A82-41548
- MORGAN, M. J.**  
Hyperacuity for luminance phase angle in the human visual system  
A82-38799

- MORGAN, T. O.**  
OTEC biofouling, corrosion, and materials study  
from a moored platform at Punta Tuna, Puerto Rico  
[DE82-007037] N82-28947
- MORGANS, L. P.**  
Physiological studies of heat stress acclimation  
during a specific exercise regimen  
[AD-A111897] N82-28991
- MOROZOV, V. G.**  
Experimental and clinical study of a new  
immunoregulatory preparation - thymalin  
N82-38177
- MOSER, M.**  
Short term gravity effects on volume homeostasis  
in man Assessment of transvascular fluid shifts  
after graded tilt  
N82-40760
- MOZSARY, P. G.**  
Suppression of osteoblast differentiation during  
weightlessness  
N82-40756
- MUELLER, M.**  
Human lymphocyte activation is depressed at low-g  
and enhanced at high-g  
N82-40658
- MUKHARLIANOV, M. N.**  
The achievements of investigations carried out in  
the years 1976-1980 on the problem of  
insufficient blood circulation and heart rhythm  
disturbances  
N82-41501
- MURADIAN, G. I.**  
The speed of blood flow in athletes subjected to  
the combined action of a training regime and  
high-altitude climatic factors  
N82-41505
- MURASHKO, L. N.**  
Study of contractile properties and composition of  
myofibrillar proteins of skeletal muscles in the  
Cosmos-1129 experiment  
N82-40701
- MUSACCHIA, I. J.**  
A new rat model for studies of hypokinesia and  
antiorthostasis  
N82-40706
- Suspension restraint - Induced hypokinesia and  
antiorthostasis as a simulation of weightlessness  
N82-40744

## N

- NABIULIN, M. S.**  
The rate at which exogenous hydrocortisone is  
eliminated from peripheral blood flow in  
patients suffering from an acute myocardial  
infarction  
N82-41498
- NACE, G. W.**  
Clinostat exposure and symmetrization of frog eggs  
N82-40757
- NADIEL, E. R.**  
Leucine and urea metabolism in acute human cold  
exposure  
N82-41211
- NAGANO, T.**  
Temporal sensitivities to square-wave gratings,  
sawtooth-wave gratings and their fundamentals -  
More evidence for multiple spatial frequency  
channels in human vision  
N82-39437
- NAIRN, J. A.**  
Orientation and energy-transfer studies on  
chlorophyll in the photosynthetic membrane  
[DE82-010180] N82-29852
- NAKAPKIN, O. A.**  
Evaluation of vestibular function in flight  
personnel with chronic diseases during stable  
remission  
N82-38179
- NAKASHIMA, T.**  
The utilization of macromolecules in blood  
purification systems  
[NRC/CNR-TT-2021] N82-29864
- NAKAYA, M.**  
Effect of athletic training on physical fitness  
under hypodynamics  
N82-40663
- Relation between physiological effects of  
gravitational forces and that of magnetic forces  
N82-40730
- Relation between physiological effects of  
gravitational forces and that of magnetic  
forces. II  
N82-40771
- NARUSE, M.**  
Effect of athletic training on physical fitness  
under hypodynamics  
N82-40663
- NASYROV, R. A.**  
Changes in neurons of the spinal cord and spinal  
ganglia under hypokinesia /neuromorphological  
and histochemical investigation/  
N82-40494
- NASYROVA, A. M.**  
Effect of high ambient temperature on carbohydrate  
metabolism in rat liver and skeletal muscles  
N82-28975
- NAZARENKO, A. I.**  
The effect of helium on gas exchange and tissue  
respiration  
N82-38165
- NECHAEV, V. I.**  
The effect of products erythrocyte destruction on  
immunological processes  
N82-40500
- NECHIPURENKO, I. D.**  
Thermodynamic parameters characterizing  
interaction between polymer-absorbed ligand  
molecules  
N82-38609
- NEPEDOVA, M. V.**  
Initial audiometric investigations in an orbital  
station  
N82-30277
- NEFF, A. W.**  
The intracellular responses of frog eggs to novel  
orientations to gravity  
N82-40758
- NEGRINCO, K. V.**  
Histochemical changes in experimental animals  
exposed to variable noise  
N82-38577
- NELSON, B. E.**  
Visual Technology Research Simulator (VTRS) human  
performance research: Phase 3  
[AD-A112475] N82-28988
- NEHETH, S.**  
Stress in space flight - Metabolic aspects  
N82-40696
- NEVASHEV, V. A.**  
The incorporation of an erythrocyte membrane into  
planar bilayer lipid membranes  
N82-38606
- NEKOVIC, S.**  
The radiolysis of aqueous propionitrile -  
Compounds of interest to chemical evolution  
studies  
N82-41197
- NEUBERT, J.**  
Gravity sensing system formation in tadpoles /Rana  
temporaria/ developed in weightlessness simulation  
N82-40759
- NIELSEN, B.**  
Aspects of cardiovascular adaptation to  
gravitational stresses  
N82-40687
- NIELSEN, C.**  
Aspects of cardiovascular adaptation to  
gravitational stresses  
N82-40687
- NIKITINA, E. V.**  
The physiological mechanisms of the arousal  
response in animals under conditions of hypobiosis  
N82-40311
- NIKITINA, Z. S.**  
The anti-stress role of the gamma-aminobutyric  
acid system of the brain  
N82-40468
- NIKITIUK, B. A.**  
Sonatotypology and athletics  
N82-40486
- NIKOLAEV, M. P.**  
Alterations in the labyrinth receptors after laser  
irradiation as detected by electron microscopy  
N82-39244

- NIXON, J. H.**  
A functional video-based anthropometric measuring system  
[NASA-CR-167637] A82-29896
- NIXON, R. D.**  
Development of a methodology for assessing aircrew workloads  
[AD-A114364] A82-29010
- NIZOVITSEV, V. P.**  
The use of hyperoxic mixtures for the diagnosis of latent disturbances in the external respiration system A82-40457
- NOGUES, C.**  
Validation of a new method for studying the effects of vibration on the primate spine A82-40768
- NORSK, P.**  
Aspects of cardiovascular adaptation to gravitational stresses A82-40687  
Vestibular effects of water immersion and Clonidine A82-40762  
Cardiovascular effects of Clonidine during 20 hours head down tilt /-5 deg/ A82-40764
- NOSKIN, V. A.**  
A measurement of the size distribution of lipoproteins in the plasma of human blood A82-38603
- NOVAK, L.**  
Skin temperature and thermal comfort in weightlessness A82-40726
- NOVIKOV, V. S.**  
The assimilation of vitamin C in seamen during voyages at high latitudes A82-41465
- NOVIKOVA, N. A.**  
The rate of coronary perfusion as a factor determining the extent to which the contractile function of the heart is decreased in energy formation disorders A82-41489
- NOVIKOVA, O. G.**  
The effect of the natural and climatic conditions of the Far North on the human cardiovascular system A82-41466
- NOVSKOVA, T. A.**  
Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions A82-38586
- NOZDRIN, V. I.**  
The structure and function of macrophages A82-41470
- NURK, A. M.**  
The influence of the GABA-receptor blocker bicuculline on the effects of fenibut and diazepam A82-38539
- NURMAND, L. B.**  
An attempt at the classification of 'patient pharmacokinetic capacities' A82-38562
- O**
- OGANESIAN, S. S.**  
Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment A82-40701
- OGANOV, V. S.**  
Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites A82-40688  
Physiological mechanisms of adaptation of rat skeletal muscles to weightlessness and similar functional requirements A82-40689  
Biorhythms of rats during and after space flight A82-40692  
Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment A82-40701
- Variability of physiological properties of rat skeletal muscles at different gravity levels A82-40702
- Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129 A82-40737
- Results of biosatellite studies of gravity-dependent changes in the musculo-skeletal system of mammals A82-40751
- OGIEVETSKAYA, M. M.**  
Changes in the microelement content of muscles under denervation A82-38598
- OLCOTT, T. M.**  
Lockheed involvement in Shuttle life sciences flight experiments A82-39541
- OMAN, C. M.**  
Dynamics of subjective discomfort in motion sickness as measured with a magnitude estimation method A82-40438
- ORANSKII, I. E.**  
Optimization of medicinal electrophoresis A82-41472
- OREKHOV, A. M.**  
RNA content distribution of cells from the normal and atherosclerotic human aorta A82-38535
- ORLOV, L. L.**  
Role of hormonal compounds in regulation of electrolyte metabolism in the presence of emotional stress N82-28952
- ORLOVA, N. M.**  
The role of the energy transport system in changes of the contractile function of the heart in the case of the measured limitation of coronary blood flow A82-41499
- ORLOVA, TS. R.**  
The effect of inotropic factors on the postexercise characteristics of the heart A82-40451
- OSTASHKOVA, Z. G.**  
Application of laser therapy to patients with osteoarthritis deformans A82-41475
- OTTELECH, A.**  
The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats A82-40713
- OYAMA, J.**  
Alterations in heat loss and heat production mechanisms in rat exposed to hypergravic fields A82-40718  
Response of rat body composition to simultaneous exercise and centrifugation at 3.1g A82-40766
- OZHIGANOV, E. L.**  
Electrical stimulation of the urinary bladder following radical surgery for cancer of the rectum A82-41479
- P**
- PACE, M.**  
Cardiovascular responses of the chronically instrumented monkey during simulated space flight A82-40670  
Body composition of rats flown aboard Cosmos-1129 A82-40695
- PAGE, S. J.**  
Human factors of an RPV ground control station A82-39749
- PALAMARCHUK, E. K.**  
Optimization of the conditions of modified cell irradiation A82-38154
- PALCHUN, V. T.**  
Application of xylite for the detection of labyrinthine hydrops A82-39243

- PANDOLF, K. B.  
Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments  
A82-40440  
Determination of maximal aerobic power during upper body exercise  
[AD-A111712] N82-29866
- PANIN, L. E.  
The role of nutrition in the changes of energy metabolism during stress  
A82-40482
- PANKOVA, A. S.  
Results of morphological investigations aboard biosatellites Cosmos  
A82-40697
- PANTELEVA, N. S.  
Reactions of O-18 exchange in the myosin systems of skeletal, cardiac, and smooth muscles  
A82-38614
- PARFENOV, G. P.  
Cellular aspects of gravitational biology  
A82-40754
- PARFENOVA, N. S.  
A measurement of the size distribution of lipoproteins in the plasma of human blood  
A82-38603
- PARTS, L.  
Superior heat-transfer fluids for solar heating and cooling applications. Results of acute oral toxicity determinations  
[DE82-003071] N82-29869
- PASECHNIK, V. I.  
A possible explanation for the fluctuations in reflectivity exhibited by bilayer lipid membranes excited during electrostriction  
A82-38602
- PASQUET, J.  
The nature and rate of occurrence of medical emergencies on board Air France aircraft  
A82-38841
- PAULIKOVA, E.  
Space flight effects upon plasma and tissue lipids in rats  
A82-40722
- PAVLIASHVILI, G. I.  
The effect of monovalent cations on the ATPase activity and superprecipitation of actomyosin  
A82-38615
- PAVLOV, A. D.  
The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis  
A82-38169  
The synthesis of nuclear and mitochondrial DNA and RNA, and the synthesis of heme and globin in rabbit bone marrow during the stimulation of erythropoiesis  
A82-40501
- PAVLOVA, N. N.  
Osteoporosis in unsupported extremities  
N82-28970
- PAVLOVSKAIA, T. E.  
Abiogenic synthesis of the peptide bond. II  
A82-39426  
Abiogenic synthesis of the peptide bond. I  
A82-39448
- PAYNE, D. R.  
Development of a methodology for assessing aircrew workloads  
[AD-A114364] N82-29010
- PENKOVSKAIA, N. P.  
The participation of the lymphatic system in the resistance of an organism to hypoxia  
A82-39793
- PEOPLES, A. G.  
The accuracy of venturi masks at altitude  
A82-40445
- PESSENHOFER, H.  
Analysis of transient cardiovascular response to orthostatic stress using noninvasive methods  
A82-40740
- PETERSON, D. F.  
Effect of baroreceptor denervation on +G sub z tolerance in dogs  
A82-40675
- PETOIAN, I. M.  
Setting safety standards for ionizing radiation  
A82-38580
- PETRESCU, A.  
Na<sup>+</sup>/K<sup>+</sup> dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats  
A82-40707
- PETROV, V. P.  
The assimilation of vitamin C in seamen during voyages at high latitudes  
A82-41465
- PETROVA-MASLAKOVA, L. G.  
A measurement of the size distribution of lipoproteins in the plasma of human blood  
A82-38603
- PETROVA, S. P.  
Cytogenetic analysis of peripheral blood lymphocytes of individuals exposed to low doses of ionizing radiation  
N82-29856
- PETRY, H. M.  
Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating  
A82-38795
- PILET, P. E.  
Root cell gravireaction - Hormone interaction  
A82-40745
- PINENTAL, M. A.  
Determination of maximal aerobic power during upper body exercise  
[AD-A111712] N82-29866
- PINEGIN, B. V.  
Effect of the combined administration of antibiotic-resistant bifidobacteria and the corresponding antibiotics on the survival of irradiated mice  
A82-38581
- PISKOPPEL, A. A.  
From a man-machine system to a social-engineering system  
A82-40447
- PISKUNOV, V. V.  
The conditions attending muscular strain in work involving only a few types of movements  
A82-38569
- PITTACO, M.  
Physiological stresses in flying a sailplane  
A82-38850
- PITTS, G. C.  
Body composition of rats flown aboard Cosmos-1129  
A82-40695  
Response of rat body composition to simultaneous exercise and centrifugation at 3.14g  
A82-40766
- PIVOVAROV, I. I.  
Alterations in heart work rhythm during hyperactivation of the anterior amygdaline nucleus  
A82-38545  
The effect of hyperactivation of the anterior amygdaloid nucleus on heart activity during states of altered reactivity  
A82-40454
- PLAKHOTA-PLAKUTINA, G. I.  
Results of morphological investigations aboard biosatellites Cosmos  
A82-40697
- PLEASANT, L.  
Biomedical research publications: 1980 - 1982  
[NASA-CR-3587] N82-29848
- PLEASANT, L. G.  
Chemical evolution and the origin of life - Bibliography Supplement 1980  
A82-38122
- PLOTNIKOVA, S. I.  
Immunological reactions to lipoproteins and heparin in young men with a hereditary tendency to atherosclerosis  
A82-41487
- POBEREZHSKAIA, A. C.  
The conditions attending muscular strain in work involving only a few types of movements  
A82-38569
- POGOSIAN, I. M.  
The speed of blood flow in athletes subjected to the combined action of a training regime and high-altitude climatic factors  
A82-41505

- POGREBINSKII, S. A.  
An LED system for the formation of visual stimul.  
A82-4047
- POIRIER, J. L.  
Orthostatic tests during cosmonaut selection  
A82-38854  
Backache in helicopter pilots  
N82-29887
- POLEVOI, V. V.  
ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation  
A82-40479
- POLIAKOVA, A. P.  
Investigation of the cardiovascular system during prolonged space flights on board the Salyut space stations  
A82-39429
- POLIAKOVA, T. S.  
Application of xylite for the detection of labyrinthine hydrops  
A82-39243
- POLUSHKINA, E. F.  
Radiation damage and recovery of mouse T-cells. IV - Elimination of radiation-induced migration abnormalities in T-lymphocytes  
A82-38156
- POLYAKOV, A. M.  
Osteoporosis in unsupported extremities  
N82-28970
- POLYAKOV, B. I.  
Reaction to diminished circulating blood volume in individuals who are susceptible and insusceptible to motion sickness (seasickness)  
N82-28960
- POLYAKOVA, A. P.  
Dynamics of left ventricular systolic phase structure during long-term (140-185 days) spaceflights  
N82-28954
- PONNAMPERUMA, C.  
Clay and the origin of life  
A82-38115  
Chemical evolution and the origin of life - Bibliography Supplement 1980  
A82-38122
- PONOMARENKO, I. I.  
A method of evaluating the functional state of the central nervous system of a person performing work  
A82-38579
- POPOV, I. G.  
Metabolic distinctions related to intake of low-calorie 'survival' rations consisting only of readily assimilated carbohydrates  
N82-28953
- POPOVIC, V.  
Antiorthostatic hypokinesia and circulation in the rat  
A82-40741
- POPOVICH, I. L.  
The effect of hypokinesia on the resistance of the heart to hypoxia  
A82-38170  
The effect of hypokinesia on the resistance of the heart to hypoxia  
A82-40502
- POPPEI, M.  
Biorhythms of rats during and after space flight  
A82-40692  
Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129  
A82-40737
- PORTUGALOV, V. V.  
Results of morphological investigations aboard biosatellites Cosmos  
A82-40697
- POTAPENKO, A. I.  
Radiation-induced shortening of the life span of D. melanogaster. II - Sensitizing effects of 5-bromo-2-deoxyuridine  
A82-38155
- POTAPOV, A. M.  
Physiological mechanisms of adaptation of rat skeletal muscles to weightlessness and similar functional requirements  
A82-40689
- Variability of physiological properties of rat skeletal muscles at different gravity levels  
A82-40702
- POTAPOV, P. P.  
Condition of rats connective tissue during long-term hypokinesia and in recovery period  
N82-28969
- POZSGAI, A.  
The effect of hypokinesia and hypoxia on the function of muscles  
A82-40739
- PRASLICKA, M.  
Space flight effects upon plasma and tissue lipids in rats  
A82-40722  
Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats  
A82-40723
- PRIMIANO, F. P., JR.  
A nonlinear model combining pulmonary mechanics and gas concentration dynamics  
A82-41230
- PRITYKA, A. P.  
The diagnostic value of phonoenterography in acute renal failure  
A82-40478
- PROEHL, W.  
Initial audiometric investigations in an orbital station  
N82-30277
- PROKHOROV, A. A.  
Setting hygienic standards to be applied to environmental standards pertaining to the rolling stock of railroads and subway systems  
A82-38578
- PROKOPENKO, I. I.  
The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice  
A82-38556
- PROKOVA, E. M.  
The conditions attending muscular strain in work involving only a few types of movements  
A82-38569
- PROSKURKINA, O. A.  
The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension  
A82-40477
- PSHEDROMIRSKII, L. L.  
Physiological and hygienic analysis of the response of young truck drivers to their work load  
A82-38567
- PSHETAKOVSKII, I. L.  
Application of laser therapy to patients with osteoarthritis deformans  
A82-41475
- PTITSYNA, N. G.  
Synchronization of cardiovascular accidents with physical clocks  
N82-28956
- PUGINA, A. M.  
The rate at which exogenous hydrocortisone is eliminated from peripheral blood flow in patients suffering from an acute myocardial infarction  
A82-41498
- PUTIENKO, A. G.  
The detection of premorbid states and cardiovascular diseases during medical examinations of seamen  
A82-38553
- PUTVINSKII, A. V.  
Nonthermal effect of nanosecond microwave pulses on the transepithelial transport of sodium ions  
A82-38586

## Q

- QUANDRIEU, P.  
Validation of a new method for studying the effects of vibration on the primate spine  
A82-40768
- QUINN, B.  
Detection/discrimination in the long-wavelength pathways  
A82-39439

## QUINN, C. E.

- Morphogenesis of a higher plant from cultured cells and embryos in space  
A82-40666

## R

## RADICE, G. P.

- The intracellular responses of frog eggs to novel orientations to gravity  
A82-40758

## RADZHAPOVA, M. V.

- Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats  
A82-38159

## RAGIMOV, S. E.

- The effect of inotropic factors on the postexercise characteristics of the heart  
A82-40451

## RAHLHANN, D. P.

- Cardiovascular responses of the chronically instrumented monkey during simulated space flight  
A82-40670  
Body composition of rats flown aboard Cosmos-1129  
A82-40695

## RAIKHAN, L. M.

- The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase  
A82-38591

## RAITSES, I. V.

- The effect of repeated episodes of emotional stress on heart activity and the content of monoamines in the heart  
A82-38163

## RAKHINDZHANOV, A. R.

- Characteristics of night sleep disorders in the case of myocardial infarction according to polygraphic data  
A82-41491

## RAKHMANOV, A. S.

- Mechanisms of the effects of weightlessness on the motor system of man  
A82-40752

## RAKITA, D. B.

- Enzymes that detoxify active forms of oxygen and lipoperoxide in experimental ischemia and myocardial infarction  
A82-38540

## RAKUL, A. D.

- A comparison between the protonophoric and separating functions of weak dibasic acids  
A82-38590

## RAMBAUT, P. C.

- Dynamics of weight loss during prolonged spaceflight  
A82-40673

## RAMDZHUTUN, U. SH.

- The tolerance to physical loads in women during menopause complicated by climacteric neurosis with cardialgia  
A82-41495

## RANTA, J.

- On the mathematical modelling of microbial age dynamic and some control aspects of microbial growth processes  
A82-38823

## RAPCSAK, M.

- Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment  
A82-40701

## RAZINKIN, S. M.

- The combined effect of carbon monoxide and total-body vibration on the organism  
A82-40475

## RAZUMOVSKII, P. M.

- The effect of laser radiation on lipid synthesis in yeast  
A82-38585

## RECK, J.

- Human lymphocyte activation is depressed at low-g and enhanced at high-g  
A82-40658

## REGAN, D.

- Neurons in cat visual cortex tuned to the direction of motion in depth - Effect of positional disparity  
A82-39434

## REIBOLD, R. C.

- Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting  
A82-40442

## REMES, P.

- The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats  
A82-40713

## REMIZOV, S. M.

- Osteoporosis in unsupported extremities  
N82-28970

## REPIN, V. S.

- RNA-content distribution of cells from the normal and atherosclerotic human aorta  
A82-38535

## RESCHIKOV, V. P.

- Separation of bone marrow cells in mice by free-flow electrophoresis  
A82-38536

## RIAGO, L. K.

- The influence of the GABA-receptor blocker bicuculline on the effects of fenibut and diazepam  
A82-38539

## RICHARDS, K. L.

- Instantaneous stroke volume in man during lower body negative pressure /LBNP/  
A82-40683

## RICHMOND, D. R.

- The biological effects of repeated blasts [AD-A113113]  
N82-28990

## RIGGS, L. A.

- Changes in the human visually evoked cortical potential in response to chromatic modulation of a sinusoidal grating  
A82-38795

## RIEZUTO, A.

- Subjective response to negative air ion exposure  
A82-40446

## ROACH, J. W.

- Rule-based programming for human-computer interface specification [AD-A113036]  
N82-29007

## ROBERTS, W. E.

- Suppression of osteoblast differentiation during weightlessness  
A82-40756

## ROBERTSON, R. J.

- Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218

## ROBY, F. B.

- Acid-base, metabolic, and ventilatory responses to repeated bouts of exercise  
A82-41219

## RODIONOV, A. V.

- Psychic stress in athletic activity  
A82-40489

## ROECKER, L.

- Methodological aspects of future cardiovascular research in space  
A82-40652

- ADH suppression under immersion combined with dehydration  
A82-40776

## ROMANOV, A. I.

- A comparison of echo- and kinetocardiographic indicators of the myocardial contractility of the left ventricle in patients suffering from various forms of ischemic heart disease  
A82-41496

## ROMANOV, I. A.

- Diurnal changes in the duration of the S and G2 phases of the mitotic cycle in mononuclear and binuclear hepatocytes of normal and thyroxine-treated rats  
A82-40459

## ROMANOVA, A. K.

- Metabolism of the thermophilic hydrogenous bacterium *Pseudomonas thermophila* K-2  
A82-39427

## ROMANOVA, I. A.

- Metabolic distinctions related to intake of low-calorie 'survival' rations consisting only of readily assimilated carbohydrates  
N82-28953

- ROODE, E. A.  
The use of electrovacuum therapy in certain diseases of the peripheral nervous system. A82-41478
- ROSENBERG, G. D.  
Bone growth in the rat mandible during space flight A82-40705
- ROSS, M. D.  
Otoconial complexes as ion reservoirs in endolymph A82-40674
- ROSTOVTSSEV, V. L.  
Increasing the efficiency of running on the basis of learning algorithms and information tools A82-40488
- ROWELL, L. B.  
Aspects of cardiovascular adaptation to gravitational stresses A82-40687
- ROYLE, G. T.  
Leucine and urea metabolism in acute human cold exposure A82-41211
- ROZENSHTEIN, L. V.  
The effect of diethylamine analog of ethmazine on the functional condition of myocardium /Clinical and experimental study/ A82-41488
- RUBIN, A. B.  
Conformational dynamics of proteins and simplest molecular 'machines' A82-38610
- RUBTSOVA, V. R.  
Diagnosis and organization of the therapy of patients with disorders of blood circulation in the brain A82-38554
- RUDNEVA, N. A.  
Separation of bone marrow cells in mice by free-flow electrophoresis A82-38536
- RUDNEVA, S. V.  
Mitotic activity and volume of epithelial cell nuclei of rat cornea following spaceflights in biosatellites A82-28965
- RUMMEL, J. A.  
Computer simulations of postural change, water immersion and bedrest - An integrative approach for understanding the spaceflight response A82-40659
- RUSSELL, J. E.  
Bone growth in the rat mandible during space flight A82-40705
- RYSTINA, S. A.  
The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones A82-38563
- RZHAVIN, A. P.  
The temperature dependence of the H-1 NMR spectrum of hydrated collagen A82-38611

## S

- SABELEMAN, E. E.  
A new rat model simulating some aspects of space flight A82-40655
- SADAMOTO, T.  
Cardiovascular responses to isometric exercise during simulated zero gravity A82-40662
- Aspects of cardiovascular adaptation to gravitational stresses A82-40687
- SADEGHI-SHOJA, MR.  
Effects of lower body negative pressure on the reliability of cardiovascular system using X-ray kymograms A82-40728
- SAIDALIEV, P.  
Characteristics of night sleep disorders in the case of myocardial infarction according to polygraphic data A82-41491

- SAIDEL, G. M.  
A nonlinear model combining pulmonary mechanics and gas concentration dynamics A82-41230
- SAIKI, H.  
Effect of athletic training on physical fitness under hypodynamics A82-40663
- Relation between physiological effects of gravitational forces and that of magnetic forces A82-40730
- Relation between physiological effects of gravitational forces and that of magnetic forces. II A82-40771
- SAIKI, M.  
Relation between physiological effects of gravitational forces and that of magnetic forces A82-40730
- SAKHAROV, M. P.  
The effect of inotropic factors on the postexercise characteristics of the heart A82-40451
- SALE, D. G.  
Neuromuscular adaptation in human thenar muscles following strength training and immobilization A82-41213
- SALTYKOV, I. I.  
The detection of premorbid states and cardiovascular diseases during medical examinations of seamen A82-38553
- SALTYKOVA, V. A.  
Prevention of heart function abnormalities during reoxygenation after ischemia by adaptation to altitude hypoxia A82-40455
- SAMALLO, J.  
Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of *Neurospora crassa* A82-38698
- SAHN, S.  
Aircraft and crew scheduling during airlift operations [AD-A114114] N82-29011
- SANONINA, G. E.  
The protective role of the forebrain with respect to pathological cardiac reflexes A82-38543
- SANCHEZ, J.  
Detection/discrimination in the long-wavelength pathways A82-39439
- SANDLER, H.  
Low-G simulation in mammalian research A82-40654
- Changes in blood volume and response to vaso-active drugs in horizontally caged primates A82-40657
- Cardiovascular responses of the chronically instrumented monkey during simulated space flight A82-40670
- Influences of horizontal hypokinesia on performance and circadian physiological rhythms in female humans A82-40682
- Telemetry methods for monitoring physiological parameters A82-41551
- SARKISIAN, V. A.  
Spatial organization of the vestibular influences on the cerebellar fastigial neurons of cats A82-40312
- SASS, D.  
Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129 A82-40737
- SASSCHER, D. S.  
OTEC biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico [DE82-007037] N82-28947
- SATO, F.  
In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys A82-41214



- SATO, K.  
In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys  
A82-41214
- SAUNDERS, J. E.  
Discrimination and detection thresholds - The effect of observer criterion on the spatial properties of chromatic and achromatic mechanisms  
A82-39438
- SAUSENG, N.  
Analysis of transient cardiovascular response to orthostatic stress using noninvasive methods  
A82-40740
- SAVCHENKO, T. V.  
Diurnal changes in the duration of the S and G2 phases of the mitotic cycle in mononuclear and binuclear hepatocytes of normal and thyroxine-treated rats  
A82-40459
- SAVICH, M. L.  
The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase  
A82-38591
- SAVINA, E. A.  
Results of morphological investigations aboard biosatellites Cosmos  
A82-40697
- SAVINA, Y. A.  
Preparation of labyrinthectomized animals for flight aboard Cosmos-936 biosatellite  
N82-28971
- SAVITSKII, I. V.  
State of the lactate dehydrogenase reaction in the muscular tissue of irradiated animals  
A82-38158
- SAWKA, M. N.  
Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments  
A82-40440  
Determination of maximal aerobic power during upper body exercise  
[AD-A111712]  
N82-29866
- SCHATTE, C. L.  
Effect of simulated weightlessness on energy metabolism in the rat  
A82-40677
- SCHATZ, A.  
Changes of periodic protoplasmic movements on the fast clinostat  
A82-40725
- SCHERTEL, E. R.  
Centrifuge high-g effects on temperature regulation in unanesthetized rats  
A82-40671
- SCHICK, P. V.  
Psychological investigation of pilot behavior during integration of control systems in the cockpit of passenger airliners  
A82-40560
- SCHLEGEL, T.  
Biorhythms of rats during and after space flight  
A82-40692  
Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129  
A82-40737
- SCHMID, P. G.  
Metabolic and cardiovascular adaptations in trained hypophysectomized rats  
A82-41215
- SCHMIDT, D. H.  
Effect of warm-up on left ventricular response to sudden strenuous exercise  
A82-41212
- SCHMITT, R. P.  
Technical assessment of the prevention of micro-fouling on OTEC heat-transfer surfaces through the use of ultraviolet radiation  
[DE82-005489]  
N82-29850
- SCHUBERT, F. H.  
Preprototype independent air revitalization subsystem  
[NASA-CR-167703]  
N82-29898
- SCHWABERGER, G.  
Analysis of transient cardiovascular response to orthostatic stress using noninvasive methods  
A82-40740
- SCHWARTZ, A. W.  
Uracil synthesis via HCN oligomerization  
A82-38117  
Acceleration of HCN oligomerization by formaldehyde and related compounds - Implications for prebiotic syntheses  
A82-41199
- SCHWARTZ, R. M.  
Evolution of major metabolic innovations in the Precambrian  
A82-38121
- SCIARAPPA, D.  
Effect of physical training in cool and hot environments on +Gz acceleration tolerance in women  
A82-40664
- SCOBEE, R. P.  
Effects of reference lines on displacement thresholds at various durations of movement  
A82-38797
- SEKULER, R.  
Aging and visual function of military pilots - A review  
A82-40435
- SELIVANOV, I. I.  
Functional properties of T-lymphocytes in patients with acute myocardial infarction  
A82-41459
- SEME NOV, E. V.  
Biochemical aspects of the mechanism by which cholinolytics affect the brain  
A82-41468
- SEME NOV, N. I.  
Problems in the metrology of the training load of ski racers  
A82-41502
- SEME NOV, S. V.  
Optimization of the conditions of modified cell irradiation  
A82-38154
- SEMENTSOV, V. M.  
Intracutaneous partial oxygen pressure (pO<sub>2</sub> sub ic) in man during short-term space flights: Results of joint USSR-GDR space flight  
N82-30278
- SEHUSHKINA, T. M.  
The impulse activity of neurons in the nodose ganglion during acute hemodynamic and respiratory disorders  
A82-38546
- SEPETOVA, M. G.  
Mitotic activity and volume of epithelial cell nuclei of rat cornea following spaceflights in biosatellites  
N82-28965
- SERGEEVA, Z. M.  
Respiratory movements of the facial muscles and respiratory resistance  
A82-40456
- SERNIAK, P. S.  
The diagnostic value of phonoenterography in acute renal failure  
A82-40478
- SEROVA, L. V.  
Adaptation to weightlessness and its physiological mechanisms - Results of animal experiments aboard biosatellites  
A82-40688  
Weightlessness effects on resistance and reactivity of animals  
A82-40690
- SHABAYEV, V. P.  
Effects of low-intensity electromagnetic fields on human and animal erythrocytes  
N82-28974
- SHAFIRKIN, A. V.  
Methodological aspects of testing erythrocyte balance by counting incubated reticulocytes  
N82-28972
- SHAIKHIEV, U. SH.  
The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones  
A82-38563
- SHAITAN, K. V.  
Conformational dynamics of proteins and simplest molecular 'machines'  
A82-38610

- SHAKHOV, B. E.  
A modification of Souns' method of selective  
coronarography  
A82-41485
- SHANNON, R. H.  
Task analysis and the ability requirements of  
tasks: Collected papers  
[AD-A111181] N82-29000  
Biomechanical analysis of tasks involving manual  
materials handling  
[AD-A113955] N82-29009
- SHAPIRO, Y.  
Auxiliary cooling - Comparison of air-cooled vs.  
water-cooled vests in hot-dry and hot-wet  
environments  
A82-40440
- SHARDAKOVA, E. F.  
The effect of certain characteristics of work  
motions on the tolerance of hand muscles to  
static exertions  
A82-38568
- SHAROVA, E. V.  
Intrahemispherical relations of EEG slow-wave  
components in patients with local brain lesions  
A82-40472
- SHATERNIKOV, V. A.  
Physical activity and human requirements for  
energy and food substances  
A82-40487
- SHCHEDROVITSKII, L. P.  
From a man-machine system to a social-engineering  
system  
A82-40447
- SHCHEGLOVA, M. V.  
The absence of the magnetic-field effect on Na<sup>+</sup>/K<sup>+</sup>-dependent ATPase  
A82-38591
- SHEPER, V. F.  
Age changes in the cerebral cortex of humans and  
cats /A comparative electron-microscopical  
investigation/  
A82-40496
- SHEPELEV, V. A.  
Selecting optimal conditions for heart  
conservation in weak aldehyde solutions by using  
mathematical methods of experimental design  
A82-38534
- SHEPPARD, D. J.  
Visual Technology Research Simulator (VTRS) human  
performance research: Phase 3  
[AD-A112475] N82-28988
- SHEREMETVA, G. F.  
The ultrastructure of the myocardium in the  
restorative period following aorto-coronary  
shunting in patients with chronic ischemic heart  
disease  
A82-41484
- SHERMAN, W. M.  
Relationship between muscle Qo2 and fatigue during  
repeated isokinetic contractions  
A82-41216
- SHERSHNEV, V. M.  
The rate at which exogenous hydrocortisone is  
eliminated from peripheral blood flow in  
patients suffering from an acute myocardial  
infarction  
A82-41498
- SHEVYAKOV, V. S.  
Theoretical and practical aspects of using  
acoustic repellants to scare birds. Part 1:  
Interspecificity and geographic (regional)  
distinctions of acoustic repellants  
N82-29858
- SHIMIZU, M.  
Molecular basis for the genetic code  
A82-41195
- SHIMOYAMA, I.  
Clay and the origin of life  
A82-38115
- SHIMUK, M. F.  
A comparison of echo- and kinetocardiographic  
indicators of the myocardial contractility of  
the left ventricle in patients suffering from  
various forms of ischaemic heart disease  
A82-41496
- SHIPOV, A. A.  
Artificial gravity in space flight  
A82-40691
- Preparation of labyrinthectomized animals for  
flight aboard Cosmos-936 biosatellite  
N82-28971
- SHIRIAEV, A. G.  
Problems in the metrology of the training load of  
ski racers  
A82-41502
- SHIROKOV, V. S.  
The diagnostic value of phonoenterography in acute  
renal failure  
A82-40478
- SHIRVINSKAIA, M. A.  
Physiological mechanisms of adaptation of rat  
skeletal muscles to weightlessness and similar  
functional requirements  
A82-40689
- Variability of physiological properties of rat  
skeletal muscles at different gravity levels  
A82-40702
- SHISHKINA, A. V.  
Diagnosis and organization of the therapy of  
patients with disorders of blood circulation in  
the brain  
A82-38554
- SHISHKINA, L. M.  
Study of the relation between the number of  
sulfhydryl groups and the level of lipid  
antioxidant activity in the organs of individual  
animals of different species  
A82-38153
- SHKHVATSABAIA, I. K.  
The influence of psychological and somatic factors  
on the symptoms of hypertension  
A82-41492
- SHKLOVSKII-KORDI, M. E.  
Ion currents through a neuron membrane during the  
injection of cyclic nucleotides  
A82-38588
- SHLAIN, V. A.  
The effect of inotropic factors on the  
postexercise characteristics of the heart  
A82-40451
- SHLYGIN, V. V.  
An evaluation of the informativeness of EKG  
parameters in diagnosing a myocardial infarction  
of the back wall of the left ventricle  
A82-41493
- SHLYK, G. G.  
Biorhythms of rats during and after space flight  
A82-40692
- SHMELEV, G. E.  
A measurement of the size distribution of  
lipoproteins in the plasma of human blood  
A82-38603
- SHTEMBERG, A. S.  
Dynamics of a stabilized motor defensive  
conditioned reflex for different levels of  
motivation in irradiated rats  
A82-40464
- SHTRANKFELD, I. G.  
Acridine orange inhibition of the ATPase activity  
of myosin and its fragments  
A82-38613
- SHUBIN, V. S.  
Regulation of cerebral circulation in erect position  
N82-28957
- SHUGUSHEV, KH. KH.  
The effect of diethylamine analog of ethmozine on  
the functional condition of myocardium /Clinical  
and experimental study/  
A82-41488
- SHUSTOV, V. M.  
X-ray study of loaded skeletal portions in the  
upper extremities of athletes engaging in karate  
A82-40490
- SHUSTROVA, M. M.  
Occult bacterial persistence and resistance to  
colonization after antibiotic therapy  
A82-40460
- SHUTOVA, T. V.  
Application of laser therapy to patients with  
osteoarthrosis deformans  
A82-41475
- SHVAB, T. IU.  
The achievements of investigations carried out in  
the years 1976-1980 on the problem of  
insufficient blood circulation and heart rhythm  
disturbances  
A82-41501

- SHVARTZ, E.  
Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting  
A82-40442
- SHVETS, M. A.  
The effect of denervation and tendotomy on oxidative phosphorylation in skeletal muscles of the rabbit and the resistance of phosphorylation to uncoupling agents  
A82-38171  
The effect of denervation and tendotomy on oxidative phosphorylation in the skeletal muscles of the rabbit and on the resistance of phosphorylation to uncoupling agents  
A82-40504
- SHVETS, V. M.  
Results of morphological investigations aboard biosatellites Cosmos  
A82-40697
- SHVINKA, N. E.  
Gramicidin A-induced conductance of the muscle fiber membrane  
A82-38605
- SIEGEL, S. M.  
Mechanical chemical and bio-hazards  
A82-39159
- SIMAKOV, A. B.  
Microelectronic electrode probe for testing brain electrical activity  
N82-28982
- SIMMONS, D. J.  
Bone growth in the rat mandible during space flight  
A82-40705  
Adaptation of the rat skeleton to weightlessness and its physiological mechanisms - Results of animal experiments aboard the Cosmos-1129 biosatellite  
A82-40753
- SIMMONS, J. B., II  
Effect of simulated weightlessness on energy metabolism in the rat  
A82-40677
- SIMON, L.  
Spatial organization of the vestibular influences on the cerebellar fastigial neurons of cats  
A82-40312  
Labyrinth plugging as a model of suspended vestibular sensory input  
A82-40721
- SIMONIDZE, M. SH.  
The effect of monovalent cations on the ATPase activity and superprecipitation of actomyosin  
A82-38615
- SINOPALNIKOV, A. I.  
Echocardiographic characterization of heart hypertension  
A82-40307
- SJOGAARD, G.  
Aspects of cardiovascular adaptation to gravitational stresses  
A82-40687
- SKAGEN, K.  
Aspects of cardiovascular adaptation to gravitational stresses  
A82-40687  
The effect of Clonidine on peripheral vasomotor reactions during simulated zero gravity  
A82-40763
- SKIPKA, W.  
Relevance of aldosterone on circulatory, renal and blood reactions during simulated weightlessness and on aerobic metabolic rate  
A82-40736
- SKOTSELIAS, IU. G.  
A factor of resistance to emotional stress in the brain of rats  
A82-40452
- SKRINAR, G. S.  
Effect of induced erythrocythemia on hypoxia tolerance during physical exercise  
A82-41218
- SKRIPAL, B. A.  
Use of the thermovision method in the prophylactic examination of polar workers  
A82-38565
- SKURATOVA, S. A.  
Physiological mechanisms of adaptation of rat skeletal muscles to weightlessness and similar functional requirements  
A82-40689  
Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment  
A82-40701  
Variability of physiological properties of rat skeletal muscles at different gravity levels  
A82-40702
- SMAJDA, B.  
Space flight effects upon plasma and tissue lipids in rats  
A82-40722
- SMIRNOV, K. V.  
Space gastroenterology  
A82-40643
- SMIRNOV, V. A.  
Efficacy of kavinton in prevention of motion sickness  
N82-28961
- SMIRNOVA, T. A.  
The regulation of calcium exchange in the cells of different regions of the warm-blooded animal heart  
A82-40313  
Body composition of rats flown aboard Cosmos-1129  
A82-40695
- SMITH, A. H.  
Study of high-g effects in animals  
A82-40651  
Effects of high-G on ventilation/perfusion in the domestic fowl  
A82-40672  
Body composition of rats flown aboard Cosmos-1129  
A82-40695  
Gravitational adaptation of animals  
A82-40716  
Restraint of animals in space research  
A82-40748  
Embryonic development during chronic acceleration  
A82-40755  
Chronic acceleration and brain density  
A82-40769
- SNYDER, R. G.  
Ultra-high impact free-fall survival  
A82-40684
- SOBAR, I.  
Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles  
A82-40712
- SOKOLOV, V. E.  
The histochemistry of enzymes in specific skin glands of the European hedgehog /Erinaceus europaeus/ during hibernation  
A82-39792
- SOLOGUB, E. B.  
The cortical regulation of human motion  
A82-39283
- SOLOGUB, M. I.  
Changes of intracellular rest potential and the length of isolated muscle under different loads  
A82-40480
- SOLOMATINA, E. S.  
The rate of coronary perfusion as a factor determining the extent to which the contractile function of the heart is decreased in energy formation disorders  
A82-41489
- SOLOVEV, V. S.  
The toxic properties of rabbit and dog sera under controlled hyperthermia  
A82-40458
- SOLOVEVA, G. R.  
Present-day magnetic-field sources, used in medical treatment  
A82-41481
- SOROKIN, L. V.  
Two phases of the inotropic effect of adrenaline - The calcium dependence  
A82-38549
- SOROKOUNOV, V. A.  
Local cerebral blood flow dynamics during experimental ischemia  
A82-38544

- SPANDEGA, I. A.  
Phase analysis of dynamics of galvanic skin responses in man  
N82-29861
- SPEAR, R. C.  
An approach to the preliminary evaluation of Closed Ecological Life Support System (CELSS) scenarios and control strategies [NASA-CF-166368]  
N82-29897
- SPECTOR, M.  
Evidence for arrested bone formation during spaceflight  
A82-40767
- SPENGLER, D. M.  
Effect of space flight on bone strength  
A82-40680
- SPINELLI, D.  
Contrast influence on perceived orientation  
A82-38796
- SPIRIC, V.  
The radiolysis of aqueous propionitrile - Compounds of interest to chemical evolution studies  
A82-41197
- SPORRONG, A.  
Vibration and decompression gas bubbles  
A82-40729
- SREBNITSKAIA, L. K.  
Proof of the existence of Ca<sup>2+</sup>/-induced structural changes in stems of myosin-containing filaments of vertebrate skeletal muscles  
A82-38599
- STABELL, B.  
Color vision in the peripheral retina under photopic conditions  
A82-38798
- STABELL, U.  
Color vision in the peripheral retina under photopic conditions  
A82-38798
- STABROVSKAIA, V. I.  
The effect of urea and heat on the activity of lactate dehydrogenase and glucose 6-phosphate dehydrogenase  
A82-38612
- STAHR, J. D.  
An approach to the preliminary evaluation of Closed Ecological Life Support System (CELSS) scenarios and control strategies [NASA-CR-166368]  
N82-29897
- STEFFEN, J. M.  
Suspension restraint - Induced hypokinesia and antiorthostasis as a simulation of weightlessness  
A82-40744
- STEGEMANN, J.  
Relevance of aldosterone on circulatory, renal and blood reactions during simulated weightlessness and on aerobic metabolic rate  
A82-40736
- STEPANENKO, L. G.  
The characteristics of hemodynamic shifts under physical stress at mountain elevations  
A82-38166
- STEPANOVA, L. G.  
The significance of the bicycle ergometer test for evaluating the work capacity in patients with hypertension  
A82-40477
- STEPHENS, A. T.  
Quantification of pilot workload via instrument scan [NASA-CR-169238]  
N82-29900
- STEWART, F. C.  
Morphogenesis of a higher plant from cultured cells and embryos in space  
A82-40666
- STOLBUN, B. M.  
The effect of the natural and climatic conditions of the Far North on the human cardiovascular system  
A82-41466
- STONE, H. L.  
Changes in blood volume and response to vaso-active drugs in horizontally caged primates  
A82-40657
- STONEHILL, R. B.  
The accuracy of venturi masks at altitude  
A82-40445
- STRELKOV, R. B.  
Study of the radioprotective effectiveness of an hypoxic gas mixture during combined radiation and thermal injuries to rats  
A82-38159
- STUPAKOV, G. P.  
Osteoporosis in unsupported extremities  
N82-28970
- SUCHKOV, V. V.  
The effect of leu-enkephalin and thyrosine on the lymphatic and blood microvessels  
A82-41490
- SUDAKOV, K. V.  
Ultrastructural changes in the brains of rats subjected to acute emotional stress  
A82-38558
- SUDARKOV, K. V.  
A factor of resistance to emotional stress in the brain of rats  
A82-40452
- SUDOH, M.  
Effect of athletic training on physical fitness under hypodynamics  
A82-40663
- Relation between physiological effects of gravitational forces and that of magnetic forces  
A82-40730
- Relation between physiological effects of gravitational forces and that of magnetic forces. II  
A82-40771
- SUKHANOVA, N. M.  
The potential of radionuclide diagnosis of acute myocardial infarction  
A82-41458
- SULZER, R. L.  
Flight crewmember workload evaluation [AD-A114167]  
N82-29012
- SURKINA, I. D.  
The influence of a deficit of vitamins on immunity /A review of the literature/  
A82-41504
- SUSHKOV, P. V.  
Mitotic activity and volume of epithelial cell nuclei of rat cornea following spaceflights in biosatellites  
N82-28965
- SUVOROV, A. V.  
Possible impairment of respiratory regulation under hyperbaric nitrogen narcosis  
N82-28964
- SUVOROV, G. A.  
Achievements and possibilities in the research being carried out to protect workers in the 11th five-year plan from noise and vibration  
A82-38573
- SUVOROV, S. V.  
Setting hygienic standards to be applied to environmental standards pertaining to the rolling stock of railroads and subway systems  
A82-38578
- SUZUKI, Y.  
Cardiovascular responses to isometric exercise during simulated zero gravity  
A82-40662
- SVADKOVSKAIA, N. P.  
The incorporation of P-32 into various sections of the brain upon exposure to intermittent noise of low intensity  
A82-41467
- SYCHEV, V. K.  
The potential of radionuclide diagnosis of acute myocardial infarction  
A82-41458
- SYKES, H. A.  
Effect of simulated weightlessness on energy metabolism in the rat  
A82-40677
- SYTINSKII, I. A.  
The anti-stress role of the gamma-aminobutyric acid system of the brain  
A82-40468
- SZABOVA, T.  
Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats  
A82-40723

- SZEKELY, D.**  
Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization  
A82-40742
- SZIKLAI, I.**  
Effect of immobilization of the excitatory parameters of different type skeletal muscle  
A82-40710  
Effect of immobilization on the nonhistone protein composition in different types of skeletal muscles  
A82-40711  
Protein composition of mRNA containing 18S-40S subribosomal particles in soleus muscle before and after immobilization  
A82-40742
- SZILAGYI, T.**  
Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment  
A82-40701  
The effect of hypokinesia and hypoxia on the function of muscles  
A82-40739
- SZOOR, A.**  
Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment  
A82-40701  
The effect of hypokinesia and hypoxia on the function of muscles  
A82-40739
- T**
- TAIRBEKOV, M. G.**  
Cellular aspects of gravitational biology  
A82-40754
- TAKACS, O.**  
Study of contractile properties and composition of myofibrillar proteins of skeletal muscles in the Cosmos-1129 experiment  
A82-40701  
Plasticity of fast and slow muscle myofibrillar proteins in model experiments simulating weightlessness  
A82-40709  
Effect of immobilization of the excitatory parameters of different type skeletal muscle  
A82-40710  
Effect of immobilization on the nonhistone protein composition in different types of skeletal muscles  
A82-40711  
Immobilization effects upon aerobic and anaerobic metabolism of the skeletal muscles  
A82-40712
- TAKAKURA, K.**  
The utilization of macromolecules in blood purification systems [NEC/CNR-TT-2021]  
N82-29864
- TAKETOMI, Y.**  
Effect of athletic training on physical fitness under hypodynamics  
A82-40663  
Relation between physiological effects of gravitational forces and that of magnetic forces  
A82-40730
- TAKAYAMA, I.**  
Control of a direct-drive arm [AD-A114969]  
N82-29903
- TAMARINA, N. A.**  
Cultivation of insects as new branch of entomology - industrial entomology  
N82-28980
- TARASENKO, N. IU.**  
The conditions attending muscular strain in work involving only a few types of movements  
A82-38569
- TAROEV, V. F.**  
Use of the thermovision method in the prophylactic examination of polar workers  
A82-38565
- TASHAEV, SH. S.**  
The content of cAMP and cGMP in brain tissues during adaptation to ischemia  
A82-40310
- TELEGDI, G.**  
The effect of hypoxic and hypobaric exercises on the blood-brain barrier in rats  
A82-40713
- TELPUKHOV, V. I.**  
Selecting optimal conditions for heart conservation in weak aldehyde solutions by using mathematical methods of experimental design  
A82-38534
- TEOH, K. K.**  
Changes in blood volume and response to vaso-active drugs in horizontally caged primates  
A82-38160
- TEPLOV, S. I.**  
The content of cAMP and cGMP in brain tissues during adaptation to ischemia  
A82-40310
- TIASHHELOVA, V. G.**  
Equivalent doses, dose rates and times of chronic exposure to ionizing radiation for various mammals  
A82-38160
- TIGRANIAN, R. A.**  
Stress in space flight - Metabolic aspects  
A82-40696  
Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129  
A82-40698  
Effect of prolonged weightlessness on certain aspects of brain metabolism of the rat  
A82-40699  
Space flight effects upon plasma and tissue lipids in rats  
A82-40722  
Effects of space flight factors and artificial gravity on deoxyribonucleoprotein in lymphoid organs of rats  
A82-40723
- TIGRANYAN, R. A.**  
Role of hormonal compounds in regulation of electrolyte metabolism in the presence of emotional stress  
N82-28952  
Catecholamines and enzymes of their metabolism in rat myocardium after flight aboard the Cosmos-936 biosatellite  
N82-28966  
Nitrogen compound levels in tissues of rat cerebral hemispheres and cerebellum after flight aboard Cosmos-1129 biosatellite  
N82-28967
- TIKHONOV, A. V.**  
Theoretical and practical aspects of using acoustic repellants to scare birds. Part 1: Interspecificity and geographic (regional) distinctions of acoustic repellants  
N82-29858
- TIPTON, C. M.**  
Metabolic and cardiovascular adaptations in trained hypophysectomized rats  
A82-41215
- TITOV, M. I.**  
The effect of leienkephalin and thyrosine on the lymphatic and blood microvessels  
A82-41490
- TOKAREV, O. P.**  
Alterations in the labyrinth receptors after laser irradiation as detected by electron microscopy  
A82-39244
- TOLE, J. R.**  
Quantification of pilot workload via instrument scan [NASA-CR-169238]  
N82-29900
- TOMASHEVSKAYA, L. A.**  
Hygienic evaluation of an 8-mm-wave electromagnetic field  
A82-41462
- TONER, H. M.**  
Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments  
A82-40440  
Determination of maximal aerobic power during upper body exercise [AD-A111712]  
N82-29866
- TOOP, J.**  
Testosterone enhances C-14 2-deoxyglucose uptake by striated muscle [NASA-CR-169101]  
N82-28986

- TOPALY, E. E.**  
A comparison between the protonophoric and separating functions of weak dibasic acids  
A82-38590
- TOPALY, V. P.**  
A comparison between the protonophoric and separating functions of weak dibasic acids  
A82-38590
- TORDA, T.**  
Catecholamines and enzymes of their metabolism in rat myocardium after flight aboard the Cosmos-936 biosatellite  
N82-28966
- TOROK, A.**  
Effect of immobilization of the excitatory parameters of different type skeletal muscle  
A82-40710
- TOROPILA, M.**  
Space flight effects upon plasma and tissue lipids in rats  
A82-40722
- TOSTESON, T. R.**  
OTEC biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico [DE82-007037]  
N82-28947
- TRAN VAN THUC, MR.**  
Bone growth in the rat mandible during space flight  
A82-40705
- TREHOB, J.**  
Temperature and behavioral responses of squirrel monkeys to 2Gz acceleration  
A82-40774
- TREHOB, J. W.**  
Clinostat exposure and symmetrization of frog eggs  
A82-40757
- TRUBETSKOI, A. V.**  
The effect of inotropic factors on the postexercise characteristics of the heart  
A82-40451
- TRUKHANOV, K. A.**  
Synchronization of cardiovascular accidents with physical clocks  
N82-28956
- TSAPKOV, M. M.**  
Tritium oxide distribution and excretion kinetics in the exposure of animals to noise  
A82-41463
- TSAREGORODTSEV, G. I.**  
Natural and social determination of human psyche  
N82-28983
- TSCHOPP, A.**  
Effect of spaceflight on lymphocyte stimulation  
A82-40700  
Response of cultured cells to hyper- and hypogravity  
A82-40773
- TSUDZEVICH, B. A.**  
Effects of cAMP accumulation activators on certain stages of genome expression in cells upon acute radiation damage to the organism. III  
Comparative study of the properties of RNA synthesized in a system of isolated liver and spleen cell nuclei from irradiated rats and animals having been treated with serotonin prior to irradiation  
A82-38157
- TSURIKOVA, G. P.**  
Effect of caloric stimulation of vestibular system on hearing  
N82-28963
- TSYBIKOV, N. M.**  
Evidence of an immune mechanism of enzyme-hemostasis regulation  
A82-38552
- TSYRLIN, V. A.**  
Local cerebral blood flow dynamics during experimental ischemia  
A82-38544
- TULSKII, S. V.**  
Changes in man's constant electric field in the course of adaptation to hypokinesia  
A82-38595
- TUNAKOV, A. I.**  
Nystagmometry of optovestibular interaction  
N82-28962
- TURNER, R. T.**  
A new rat model simulating some aspects of space flight  
A82-40655
- Altered bone turnover during spaceflight  
A82-40679
- Effect of space flight on bone strength  
A82-40680
- Evidence for arrested bone formation during spaceflight  
A82-40767
- TURPARV, T. H.**  
Two phases of the inotropic effect of adrenaline - The calcium dependence  
A82-38549
- TVERDOKHLIB, V. P.**  
The concentration of adenyly nucleotides and creatine phosphate in the cerebral hemispheres during different manifestations of stress  
A82-38560
- TYERSKOI, I. U. L.**  
Alterations in the labyrinth receptors after laser irradiation as detected by electron microscopy  
A82-39244
- TYVIN, L. I.**  
The influence of a constant magnetic field on the epileptogenic foci in the hippocampus of rabbits  
A82-40466
- ## U
- UDALTSOVA, N. V.**  
Attributing macroscopic fluctuations in aqueous solutions of proteins and other substances to the class of flicker noise  
A82-38592
- UGOLEV, A. M.**  
Space gastroenterology  
A82-40643
- UKSUSOVA, L. I.**  
The use of hyperoxic mixtures for the diagnosis of latent disturbances in the external respiration system  
A82-40457
- ULASCHIK, V. S.**  
Optimization of medicinal electrophoresis  
A82-41472
- UMANSKII, V. IA.**  
Physiological and hygienic analysis of the response of young truck drivers to their work load  
A82-38567
- UNGUREANU, D.**  
Na<sup>+</sup>/K<sup>+</sup> dependent ATP-ase modifications of skeletal muscle and myocardium of hypokinetic rats  
A82-40707
- UPTON, A. R. M.**  
Neuromuscular adaptation in human thenar muscles following strength training and immobilization  
A82-41213
- URANO, H.**  
Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration  
A82-40720
- URBANISHVILI, L. S.**  
The use of an audio-frequency magnetic field in certain diseases  
A82-41473
- USHAKOV, A. S.**  
Body composition of rats flown aboard Cosmos-1129  
A82-40695
- USTINOVA, E. E.**  
Prevention of heart function abnormalities during reoxygenation after ischemia by adaptation to altitude hypoxia  
A82-40455
- USTIUSHIN, B. V.**  
The effect of the natural and climatic conditions of the Far North on the human cardiovascular system  
A82-41466
- UTEGENOV, B. A.**  
The effect of potassium orotate on the metabolism of certain vitamins in patients with fractures of the long tubular bones  
A82-38563
- ## V
- VACEK, A.**  
Intracutaneous partial oxygen pressure (pO<sub>2</sub> sub ic) in man during short-term space flights: Results of joint USSR-GDR space flight  
N82-30278

- VAERNES, R. J.  
Central nervous dysfunctions after near-miss accidents in diving  
A82-40443
- VAISFELD, I. L.  
Histamine in biochemistry and physiology  
A82-39290
- VAITULEVICH, S. F.  
Characteristics of human auditory evoked potentials during the lateralization of a 'moving' auditory image  
A82-40465
- VALLUCHI, M.  
Human lymphocyte activation is depressed at low-g and enhanced at high-g  
A82-40658
- VAN DEN BOOGAART, P.  
Similar genes for a mitochondrial ATPase subunit in the nuclear and mitochondrial genomes of *Neurospora crassa*  
A82-38698
- VAN ELSTRAETE, A.  
Medical emergencies on board airliners - Ground management  
A82-38846
- VARAZASHVILI, M. N.  
The influence of the speed of blood flow in the carotid artery on the hematocrit of the blood being delivered to the brain  
A82-38550
- VASHKEVICH, D. L.  
The effect of ultrasound and phonophoresis of ganglioblockers on the cardiovascular system in patients with cervical osteochondrosis  
A82-41476
- VASILENKO, G. P.  
The role of central gray matter in the activation of antipain systems of the rat's brain under stress  
A82-38547
- VASILYEV, P. V.  
Problem of accelerations in aviation medicine  
N82-28950
- VEKSHIN, N. L.  
The flavin-dependent consumption of oxygen in mitochondria under illumination  
A82-38589
- VENTERS, M. D.  
Instantaneous stroke volume in man during lower body negative pressure /LBNP/  
A82-40683  
Aortic and tibial bloodflow response to lower body negative pressure /LBNP/  
A82-40727
- VERBITSKAIA, L. B.  
Ultrastructural changes in the brains of rats subjected to acute emotional stress  
A82-38558
- VERIGO, V. V.  
Biorhythms of rats during and after space flight  
A82-40692
- VESTERHAUGE, S.  
Vestibular effects of water immersion and Clonidine  
A82-40762
- VERTCHINKINA, A. A.  
Changes in the relations of pyrimidine blocks in DNA of the hematopoietic system immediately following gamma irradiation of the animal  
A82-38152
- VETROVA, E. G.  
Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129  
A82-40698
- VETTES, B.  
Helicopter accidents  
N82-29876  
Ejection of pilots from combat aircraft  
N82-29877  
Backache in helicopter pilots  
N82-29887
- VICTOR, G.  
Effects of prolonged bedrest in antiorthostatic position on rCBF measured by <sup>133</sup>Xe inhalation technique - Effects of clonidine  
A82-40743
- VIELLEFOND, H.  
Spinal stresses in flight  
N82-29873
- VIGNERY, A.  
Bone growth in the rat mandible during space flight  
A82-40705
- VIKHERT, A. M.  
Enzymes that detoxify active forms of oxygen and lipoperoxide in experimental ischemia and myocardial infarction  
A82-38540
- VIKTOROV, I. B.  
Psychic stress in athletic activity  
A82-40489
- VILVILYAMS, I. P.  
Endurance of +Gz G forces by middle-aged people before and after 7-day immersion  
N82-28958
- VINOGRADOVA, M. P.  
ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation  
A82-40479
- VINOGRADOVA, O. S.  
The effect of the electrical stimulation of afferent pathways on neurons in septal slices  
A82-40469
- VIRU, A. A.  
The changes in the concentration of free amino acids in muscles during exercise  
A82-40314
- VISHNEVSKAIA, Z. I.  
Specificity of action of monovalent cations on the ATPase activity of myosin HMM-S-1  
A82-38594
- VISSARIONOVA, V. IA.  
Energy requirements of workers at an oil field in western Siberia  
A82-40481
- VITING, T. A.  
Role of hormonal compounds in regulation of electrolyte metabolism in the presence of emotional stress  
N82-28952
- VNUKOVA, Z. Y.  
Mitotic activity and volume of epithelial cell nuclei of rat cornea following spaceflights in biosatellites  
N82-28965
- VOET, A. B.  
Uracil synthesis via HCN oligomerization  
A82-38117
- VOGT, L.  
Selection and training of European astronauts  
A82-39507
- VOLDRICH, L.  
Pathomorphological investigation of the mechanism of cochlear damage caused by noise  
A82-39241
- VOLGAREV, M. N.  
Physical activity and human requirements for energy and food substances  
A82-40487
- VOLKMANH, C.  
Studies of specific hepatic enzymes involved in the conversion of carbohydrates to lipids in rats exposed to prolonged spaceflight aboard Cosmos 1129  
A82-40698
- VOLOZHIN, A. I.  
Changes in mineralized tissues in the case of calcitonin and somatotrophic hormone injections under hypokinesia  
A82-40503  
Osteoporosis in unsupported extremities  
N82-28970
- VON ANELN, H.  
ADH suppression under immersion combined with dehydration  
A82-40776
- VOROBEV, O. A.  
Evaluation of vestibular function in flight personnel with chronic diseases during stable remission  
A82-38179

- VORONKOV, G. S.  
The role of the energy transport system in changes of the contractile function of the heart in the case of the measured limitation of coronary blood flow  
A82-41499
- VOTRIN, I. I.  
A factor of resistance to emotional stress in the brain of rats  
A82-40452
- VRABIESCU, A.  
Simulated gravitational field influences on the aging process  
A82-40685

## W

- WACHTEL, E.  
Relation between sensoric and motoric function of Wistar rats after space flight by biosatellite Cosmos 1129  
A82-40737
- WAHTEL, E.  
Biorhythms of rats during and after space flight  
A82-40692
- WALGENBACH, S. C.  
Effects of high-G on ventilation/perfusion in the domestic fowl  
A82-40672
- WALKER, W.  
Bone growth in the rat mandible during space flight  
A82-40705
- WALL, P. T.  
In vivo and in vitro characteristics of eccrine sweating in patas and rhesus monkeys  
A82-41214
- WALRAVEN, J.  
Effect of chromatic adaptation on the achromatic locus - The role of contrast, luminance and background color  
A82-39433
- WANDRELL, B. A.  
Detection/discrimination in the long-wavelength pathways  
A82-39439
- WANNER, J. C.  
Human factor and flight safety  
A82-40885
- WARBERG, J.  
Cardiovascular effects of Clonidine during 20 hours head down tilt /-5 deg/  
A82-40764
- WASER, J.  
Evolution of early mechanisms of translation of genetic information into polypeptides  
A82-41324
- WATANABE, S.  
Autonomic reactions in labyrinthectomized rabbits during centrifuge acceleration  
A82-40720
- WATT, R. J.  
Hyperacuity for luminance phase angle in the human visual system  
A82-38799
- WAURICK, S.  
Relations between respiratory and circulatory control during gravitational load in man  
A82-40714
- WEBER, A. L.  
Formation of the thioester, N-acetyl, S-lactoylcysteine, by reaction of N-acetylcysteine with pyruvaldehyde in aqueous solution  
A82-41200
- WEIDNER, W. J.  
Effect of sustained Gz acceleration on lung fluid balance - An ultrastructural study  
A82-40761
- WERNER, J. S.  
Effect of chromatic adaptation on the achromatic locus - The role of contrast, luminance and background color  
A82-39433
- WESTRA, D. P.  
Visual Technology Research Simulator (VTRS) human performance research: Phase 3  
[AD-A112475]  
N82-28988
- WHINNERY, J. E.  
The effects of +G2 acceleration stress on right ventricular pressures in conscious miniature swine.  
A82-40676
- The effect of G sub z acceleration on pulmonary perfusion in the miniature swine  
A82-40681
- WHITE, R. T.  
Effect of the Circutone seat on hemodynamic, subjective, and thermal responses to prolonged sitting  
A82-40442
- WICKE, H. J.  
Methodological aspects of future cardiovascular research in space  
A82-40652
- ADH suppression under immersion combined with dehydration  
A82-40776
- WILLIAMS, B. A.  
Temperature and behavioral responses of squirrel monkeys to 2Gz acceleration  
A82-40774
- WILLIAMS, T. J.  
Otoconial complexes as ion reservoirs in endolymph  
A82-40674
- WINGET, C. M.  
Influences of horizontal hypokinesia on performance and circadian physiological rhythms in female humans  
A82-40682
- WINSMANN, P. R.  
Auxiliary cooling - Comparison of air-cooled vs. water-cooled vests in hot-dry and hot-wet environments  
A82-40440
- WINTER, P.  
Bone growth in the rat mandible during space flight  
A82-40705
- WITZMANN, F. A.  
Hindlimb immobilization - Length-tension and contractile properties of skeletal muscle  
A82-41209
- WOLFE, J. M.  
Gravity and the tilt aftereffect  
A82-39440
- WOLFE, M. H.  
Leucine and urea metabolism in acute human cold exposure  
A82-41211
- WOLFE, R. R.  
Leucine and urea metabolism in acute human cold exposure  
A82-41211
- WOOD, C. D.  
Antinotion-sickness efficacy of scopolamine 12 and 72 hours after transdermal administration  
A82-40437
- WOOD, E. H.  
Involuntary and voluntary mechanisms for preventing cerebral ischemia due to positive /Gz/ acceleration  
A82-40747
- WOODS, R. R.  
Preprototype independent air revitalization subsystem  
[NASA-CR-167703]  
N82-29898
- WROBLEWSKI, S.  
Some of biochemical parameters in rat brain during +Gz acceleration  
A82-40717
- WRONSKI, T. J.  
Animal models for simulating weightlessness  
A82-40749
- Skeletal abnormalities in rats induced by simulated weightlessness  
A82-41548

## Y

- YAKOVLEVA, I. Y.  
Electrometric investigation of human gustatory analyzer under normal conditions and in simulated weightlessness  
N82-29859



- YAKOVLEVA, V. I.**  
Results of morphological investigations aboard biosatellites Cosmos  
A82-40697
- YAKOVLEVA, Y.**  
Initial audiometric investigations in an orbital station  
N82-30277
- YAMAGAMI, K.**  
Temporal sensitivities to square-wave gratings, sawtooth-wave gratings and their fundamentals - More evidence for multiple spatial frequency channels in human vision  
A82-39437
- YAMAGATA, Y.**  
Formation of cyanate and carbamyl phosphate by electric discharges of model primitive gas  
A82-38116
- YARULLIN, K. K.**  
Endurance of +Gz G forces by middle-aged people before and after 7-day immersion  
N82-28958
- YEGOROV, A. D.**  
Dynamics of left ventricular systolic phase structure during long-term (140-185 days) spaceflights  
N82-28954
- YELVERTON, J. T.**  
The biological effects of repeated blasts [AD-A113113]  
N82-28990
- YOUNG, G.**  
A design methodology for nonlinear systems containing parameter uncertainty: Application to nonlinear controller design [NASA-CR-166358]  
N82-29005
- YOUNG, G. E.**  
An approach to the preliminary evaluation of Closed Ecological Life Support System (CELSS) scenarios and control strategies [NASA-CR-166368]  
N82-29897
- Z**
- ZALISHVILI, M. M.**  
The effect of monovalent cations on the ATPase activity and superprecipitation of actomyosin  
A82-38615
- ZAIATS, R. P.**  
Abiogenic synthesis of the peptide bond. II  
A82-39426  
Abiogenic synthesis of the peptide bond. I  
A82-39448
- ZAICHIK, A. SH.**  
Microcalorimetry in biomedical investigations  
A82-41471
- ZAKARIAN, M. S.**  
Cytogenetic effect of 5-fluoro-2desoxy uridine in the G2 phase on intact and X-irradiated crepis capillaris L cells  
A82-40461
- ZAKHAROV, V. M.**  
The potential of radionuclide diagnosis of acute myocardial infarction  
A82-41458
- ZASS, D.**  
Biorhythms of rats during and after space flight  
A82-40692
- ZATSEPINA, G. N.**  
Changes in man's constant electric field in the course of adaptation to hypokinesia  
A82-38595
- ZAVIALOV, A. I.**  
An automated system for the collection and processing of cardiovascular information from athletes  
A82-40484
- ZBOROVSKAYA, V. I.**  
Endurance of +Gz G forces by middle-aged people before and after 7-day immersion  
N82-28958
- ZEMLIANSKAYA, T. A.**  
Energy requirements of workers at an oil field in western Siberia  
A82-40481
- ZHADINA, S. D.**  
The effect of the electrical stimulation of afferent pathways on neurons in septal slices  
A82-40469
- ZHEGNEVSKAYA, V. V.**  
ATPase activity and the potassium ion permeability of erythrocyte membranes in the presence of serotonin and radiation  
A82-40479
- ZHURAVLEV, B. V.**  
Microelectronic electrode probe for testing brain electrical activity  
N82-28982
- ZHURAVLEVA, E. L.**  
Changes in the microelement content of muscles under denervation  
A82-38598
- ZHURKOV, V. S.**  
The effect of long-wave ultraviolet radiation on cyclophosphamide-induced levels of chromosome aberrations in the bone marrow cells of mice  
A82-38556
- ZIABKINA, A. G.**  
The content of cAMP and cGMP in brain tissues during adaptation to ischemia  
A82-40310
- ZILSTORFF, K.**  
Vestibular effects of water immersion and Clonidine  
A82-40762
- ZINOVEVA, L. A.**  
Slow waves of cardiac rhythm in healthy man under different conditions  
N82-28955
- ZORBAS, Y. G.**  
Effects of lower body negative pressure on the reliability of cardiovascular system using X-ray kymograms  
A82-40728
- ZOZULIA, I. S.**  
State of adaptation in patients with hypertension  
A82-40476
- ZUEVA, M. A.**  
Reactions of O-18 exchange in the myosin systems of skeletal, cardiac, and smooth muscles  
A82-38614
- ZURABISHVILI, G. G.**  
A study of the mechanism governing the different types of behavior exhibited by the spiral excitation wave period in auricle and ventricle  
A82-38597
- ZVALINSKII, V. I.**  
Light curves for photosynthesis under intermittent illumination  
A82-38608
- ZWICK, H.**  
Long-term and progressive changes in Rhesus spectral sensitivity after low-level coherent light (514nm exposure) [AD-A111639]  
N82-28946

1 Report No. NASA SP-7011(238)		2 Government Accession No		3 Recipient's Catalog No	
4 Title and Subtitle AEROSPACE MEDICINE AND BIOLOGY A Continuing Bibliography (Supplement 238)				5 Report Date November 1982	
				6 Performing Organization Code	
7 Author(s)				8 Performing Organization Report No	
9 Performing Organization Name and Address National Aeronautics and Space Administration Washington D.C. 20546				10 Work Unit No	
				11 Contract or Grant No	
12 Sponsoring Agency Name and Address				13 Type of Report and Period Covered	
				14 Sponsoring Agency Code	
15. Supplementary Notes					
16. Abstract  <p style="text-align: center;">This bibliography lists 583 reports, articles and other documents introduced into the NASA scientific and technical information system in October 1982.</p>					
17. Key Words (Suggested by Author(s)) Aerospace Medicine Bibliographies Biological Effects			18 Distribution Statement  Unclassified - Unlimited		
19. Security Classif (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No of Pages 186	
				22. Price* \$7.00 HC	

\* For sale by the National Technical Information Service, Springfield, Virginia 22161

## PUBLIC COLLECTIONS OF NASA DOCUMENTS

### DOMESTIC

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

#### CALIFORNIA

University of California, Berkeley

#### COLORADO

University of Colorado, Boulder

#### DISTRICT OF COLUMBIA

Library of Congress

#### GEORGIA

Georgia Institute of Technology, Atlanta

#### ILLINOIS

The John Crerar Library, Chicago

#### MASSACHUSETTS

Massachusetts Institute of Technology, Cambridge

#### MISSOURI

Linda Hall Library, Kansas City

#### NEW YORK

Columbia University, New York

#### OKLAHOMA

University of Oklahoma, Bizzell Library

#### PENNSYLVANIA

Carnegie Library of Pittsburgh

#### WASHINGTON

University of Washington, Seattle

NASA publications (those indicated by an '\*' following the accession number) are also received by the following public and free libraries:

#### CALIFORNIA

Los Angeles Public Library

San Diego Public Library

#### COLORADO

Denver Public Library

#### CONNECTICUT

Hartford Public Library

#### MARYLAND

Enoch Pratt Free Library, Baltimore

#### MASSACHUSETTS

Boston Public Library

#### MICHIGAN

Detroit Public Library

#### MINNESOTA

Minneapolis Public Library and Information Center

#### NEW JERSEY

Trenton Public Library

#### NEW YORK

Brooklyn Public Library

Buffalo and Erie County Public Library

Rochester Public Library

New York Public Library

#### OHIO

Akron Public Library

Cincinnati and Hamilton County Public Library

Cleveland Public Library

Dayton Public Library

Toledo and Lucas County Public Library

#### TEXAS

Dallas Public Library

Fort Worth Public Library

#### WASHINGTON

Seattle Public Library

#### WISCONSIN

Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

### EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy of microfiche of NASA and NASA-sponsored documents, those identified by both the symbols '#' and '\*' from: ESA - Information Retrieval Service, European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France.



National Aeronautics and  
Space Administration

Washington, D.C.  
20546

Official Business  
Penalty for Private Use



National Aeronautics and  
Space Administration

Washington, D.C.  
20546

SPECIAL FOURTH CLASS MAIL  
BOOK

Postage and Fees Paid  
National Aeronautics and  
Space Administration  
NASA-451

Official Business  
Penalty for Private Use \$300



Postage Paid  
National Aeronautics and  
Space Administration



4 1 SP-7011, 821129 S90569AU 850609  
NASA  
SCIEN & TECH INFO FACILITY  
ATTN: ACCESSIONING DEPT  
P O BOX 8757 BWI ARPRT  
BALTIMORE MD 21240



POSTMASTER: If Undeliverable (Section 158  
Postal Manual) Do Not Return